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October 24, 1949

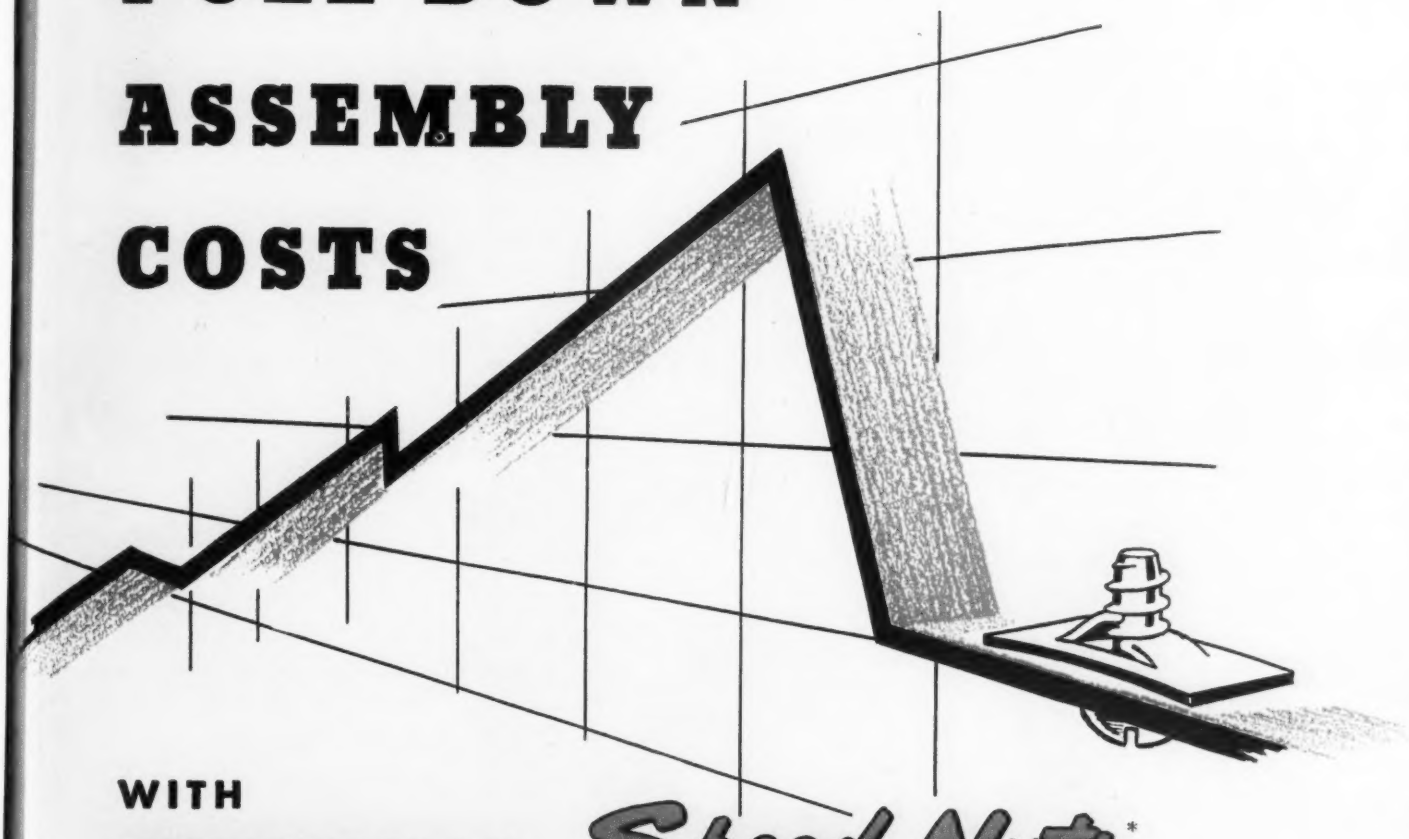
OCT 25 1949

STEEL

The Magazine of Metalworking and Metalproducing

CONTENTS — PAGE 21

PULL DOWN ASSEMBLY COSTS



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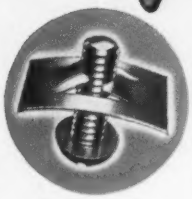

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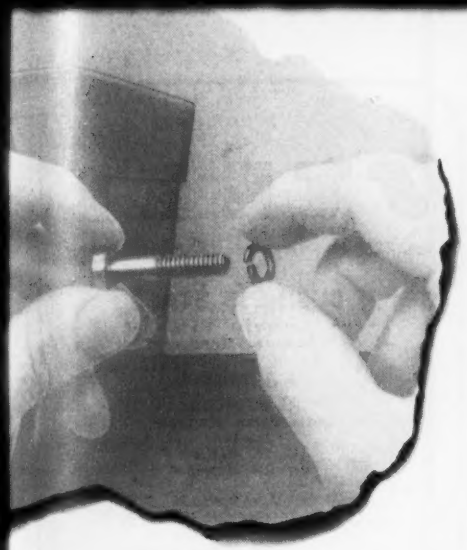

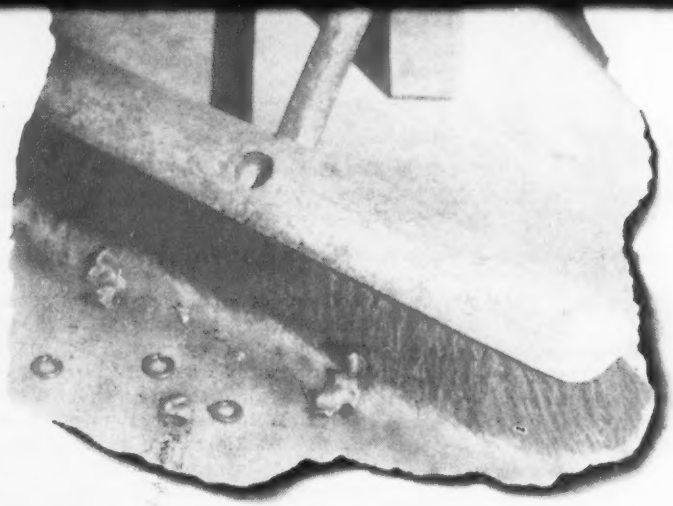

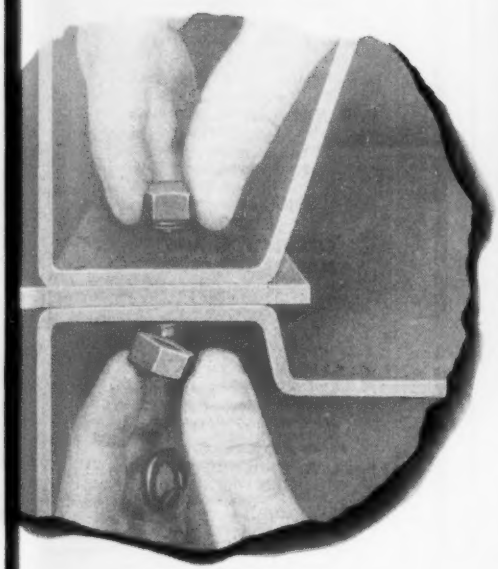

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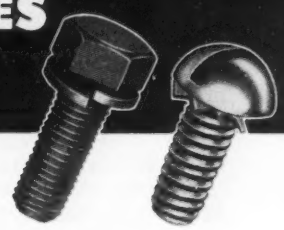

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Behind the Scenes...

Strike Notes

Last week we mentioned that trip over strike-bound Pittsburgh and the beautiful view made possible by the lack of smoke. This fine fall weather is keeping the air "bright blue" in many a mill town. But there are other byproducts of the steel strike, too. The bus station ticket seller in Lorain, Ohio, for example, reports a very sharp increase in southbound bus traffic, mostly due to Mexican and Puerto Rican workers heading for home to wait out the strike. Then there are the increases in bank loans stemming from retailers in the strike areas, where credit is being extended to striking steel and coal workers. The grocer and the butcher in mill towns know the strike will be over some day and that the bills will be paid, but meanwhile they have to increase their own credit to finance the feeding of their customers. And speaking of feeding, there is one group of people who are feeding well and having little to do during the strike. They're Great Lakes sailors, whose ships are floating idly at anchor in the lake ports. Here in Cleveland, they're painting the hulls, shining the brass, eating their usual top-flight meals and enjoying shore leave every night. With storms and gales reported on the upper lakes, they're probably happy to be in snug harbor.

New Names, Same Faces

Let's see. This is October 24, and we know a secret. Next week there'll be some changes made on this page. Watch the column to our right for details. Couldn't make them this week, because we had to go to press too early. However, we've a sneaking suspicion that the editors scooped us. Could be you'll find some announcement hidden deep in the colyumes of the news dept.

Again—Pension Paragraphs

Also next week comes another opus from the fact-dripping typewriter of Walt Campbell, our expert on pensions who is also our news editor. Normally we'd say that the other way'round, but we inverted it so we'd have a reason for telling you about a new article he's prepared for next week's book. Do you have fourth round wagitis? Are pension demands slowly choking the life blood out of your treasury? Does insurance (social, that is) give you nightmares every day? Or maybe day-dreams every night? Well, if so, you'll be glad to hear that Walter J. Campbell has come up with another. This time he's talking about the effects of these plans on small business. If you read his opus on insurance and pension plans in this book last April, or like thousands of other metalworking executives you even now have a copy of it at your elbow to guide you through the maze of pension collective bargaining, we won't have to sell you this new one. If you haven't, we have just this week pulled hot off the press for the umpteenth time reprints of that April masterpiece and we'll send one to you for the asking. And in any case you'll want to study carefully the new Campbell classic whether you are big or little business.

Yoicks! Puzzles, Yet!

Okay, so you asked for it. So we hadda go and dig up some new puzzles. So we hope they're new to all of you folks who have challenged us to stump them. That includes all New England challengers, too. The stock we now have in hand are old, tried and true, but new to us, and we will have to add that we can't figure some of them out, yet, even though we have the answers written down on little pieces of paper here and there. At any rate, here starts our new series, and we hope you can't answer them! For the first one, we have two characters making up a large flag to hang in the city park. In order to make the stars, they were supplied with white circles of cloth, ten inches in diameter. After cutting out a few stars, the first character remarked to the second, "They shouldn't have cut this cloth into circles. We are wasting more cloth from each piece than it takes to make a star." The second character, being either a puzzle fan or else mentally alert for some other reason, had his doubts, but finally proved it to his satisfaction. Can you do the same? What was the area of the star?

Shrdlu

(Editorial Index—page 21)

STEEL

Vol. 125—No. 17 October 24, 1949

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Published every Monday. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $18. Single copies (current issues) 35c. Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879. Copyright 1949 by the Penton Publishing Co.

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Business Staff on Page 4

NEXT WEEK . . .

Meeting Engineering "Specs" with New Age-Hardenable Alloy

Unusual Screw Machine Operations Step Up Production

Can You Use Chemical Methods in Finishing Aluminum?

Production of Stainless Steels—I

STEEL

The Magazine of Metalworking and Metalproducing

VOL. 125, NO. 17 OCTOBER 24, 1949

NEWS

Steel Inventories Dwindle 29
Pricing Bill Stalled 31
Capital Expenditures in Metalworking Increased in 1947 32
A Way To Cut Costs: Standardization 33
Lab-Shop Teamwork Seen at Metal Show 34
How To Cut Costs: Executives at Show Give Their Answers 35
★ Windows of Washington 36
U.S. Strike May Aid Western Europe 39
Business Builder: Record Number of New Houses in September 40
Pollution Control Grows 41
★ Calendar of Meetings 41
★ Mirrors of Motordom 43
More Industry Alignments: Three Firms Sold 46
★ Briefs 47
★ The Business Trend 49
★ Men of Industry 50
★ Construction and Enterprise 122

PRODUCTION-ENGINEERING

★ Engineering News at a Glance 57
New Rod Mill To Increase Production at Colorado Fuel & Iron 58
Sleeve Bearing Production By Unusual Casting and Machining 61
Mass Press-Forming Prominent in Steel House Production 64
Inspecting Forged Turbine Blades and Buckets 66
★ Progress in Steelmaking—Production of Seamless Steel Pipes—II 68
Intensified Steel Industry Research To Pay Off 80
★ Letters to the Editors 86
★ New Products and Equipment 89
★ Helpful Literature 95

MARKETS

★ Market Summary 97
★ Metal Prices and Composites 98
Secondary Metals Prices Rise 104

★ *Advertising Index* 128

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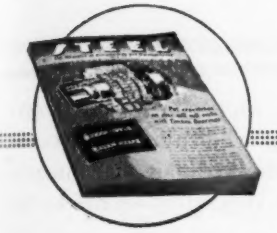


October 24, 1949

Unbalanced Progress

Many of the tens of thousands who visited the 1949 Metal Congress and Exposition in Cleveland last week must have been impressed anew by the manner in which this annual event accurately mirrors progress in the metalworking industries. If it had been possible for visitors to compare each 1949 exhibit with its counterpart at the 1939 show, or to consider the content of technical papers presented last week in relation to that of papers presented at the 1939 Congress, they would have been amazed at the remarkable advances that have been made during this exciting decade.

As pointed out elsewhere in this issue, these advances stem from a system of harmonious relations between science and shop which has been developed to a higher degree of refinement in the United States than in any other industrial nation. The lag between the time a basic idea comes from the research laboratory and the time it is translated into a part or machine in actual production is being reduced steadily. Manufacturers are more alert than heretofore to grasp the potentialities of new inventions, new materials, new machines and new processes.

Much of this alertness may be attributed to the economic pressure of this period, which calls for extraordinary ingenuity in reducing the costs of manufacture. The several hundred exhibits and the scores of papers discussed at technical sessions provided thousands of ideas which, applied properly to industry's production and manufacturing problems, can reduce costs appreciably. The 1949 Metal Congress and Exposition far exceeded expectations in the degree with which it justified its timely theme, "Economy in Production."

This highly successful event was held at a time when two of the nation's major basic industries were strike-bound. In this atmosphere, the brilliant achievements of our industries in technology, as reflected at the Cleveland show, stand out in sharp contrast to our continued difficulties in dealing with the human element in the productivity equation.

Through intelligent concentration of effort we seem to have harnessed the forces for effective progress in the physical aspects of production. It remains for us to direct the same kind of concentrated attention to the objectives of harmony between employer and employee and contentment of man with his job.

* * *

CONSIDER THE OWNERS!: Last week Henry F. Holthusen, a New York attorney who owns stock in Inland Steel Co. and Youngstown Sheet & Tube Co., wrote letters to the presidents of these companies urging that stockholders be consulted before management commits the companies to pension and insurance plans.

Mr. Holthusen wrote that until recently labor's demands related to wages and working conditions, which problems clearly are a function of management. Now the insurance and pension proposals involve such heavy drains upon current earnings and accumulated assets that it is doubtful whether management has the power to commit companies without stockholder consent.

This is a strong argument. In most companies management would not dare propose a pension plan on its own initiative without first obtaining approval of directors. In some companies, the directors would insist upon putting the proposition up to the stockholders. When a plan originates from the demands of a union—especially if the demands are on an industry-wide basis—the propriety of obtaining stock-

(OVER)

holder consent is even more pronounced than if the plan had originated with management.

Stockholders constitute a representative cross-section of the American public. In many companies the number of stockholders exceeds the number of employees. Whether or not a company's by-laws provide that pensions be referred to stockholders, management is bound morally to discharge its obligation to owners as assiduously as it meets its obligation to employees.

—pp. 29, 30

* * *

CONTINUOUS TUBE MILL: In Part II of "Production of Seamless Steel and Tubes," Author Bryant Bannister, consulting engineer of National Tube Co., describes the "continuous" tube rolling process and discusses its possibilities.

Principal equipment for "continuous" rolling includes a rotary billet heating furnace, cone type Mannesman piercing mill, nine-stand continuous rolling mill, reheating furnace and universal stretch reducing mill. An installation of this kind now under construction by National Tube Co. is designed to deliver pipe 65 feet long in sizes from 2 to 4½ inches OD at rates up to 900 feet per minute out of the last stand of rolls. From the stretch reducing mill lengths up to 400 feet and delivery rates as high as 2200 feet per minute will be attained.

This maximum delivery rate—25 miles of pipe per hour—probably will not be achieved in actual production for obvious reasons. Nevertheless the output will exceed that of orthodox tube mills by such a margin that the "continuous" feature may be termed revolutionary. —p. 68

* * *

STEEL IN SMALL HOMES: American Iron & Steel Institute finds that as of September, 1949, an average six-room house takes about 3.5 tons of steel products. This is about double the poundage consumed in 1938.

Principal uses for steel in today's six-room house are 1800 pounds of steel lath; 1200 pounds of pipe for gas, water and heating (1.5 tons additional for radiant heating); nails and miscellaneous wire, 600 pounds; gutters and downspouts, 475 pounds; flashing, 200 pounds; hardware, 90 pounds; steel conduit, 140 pounds; heating system, 300 to 800 pounds; bathroom, 300 pounds; and kitchen equipment, 800 pounds. There may be other uses for steel, such as window frames, angles for lintels, I beams for floor joist supports, steel columns and railings.

Steel faces stiff competition in some of these applications. Rock lath versus steel lath, copper versus steel for pipe, copper against galvanized sheets for flashing, and aluminum compared with steel for window frames are sharply competitive. In spite of this, steel seems to be gaining ground. —p. 40

* * *

CURB WATER POLLUTION: A movement which industry cannot afford to ignore is the increasing tendency on the part of municipal, state and federal governments to do something about water pollution. The metalworking industries come into the situation prominently because their use of river, harbor and lake waters is one of the three major causes of contamination. The other two are public sewage disposal and soil erosion.

The problem is particularly acute in areas of heavy, industrial concentration. The largest pollution program now in progress is that administered by the Ohio River Valley Sanitation Commission which is seeking to control contamination in the 200,000-square mile Ohio river drainage basin. Another project is cleaning international boundary waters between the United States and Canada from Port Huron, Mich., to Toledo, O.

From the standpoint of self-interest as well as public interest, industry should co-operate wholeheartedly in pollution control. —p. 41

* * *

BUYING NEW EQUIPMENT: Figures compiled by the Bureau of Census reveal the breakdown of the metalworking industry's expenditures for plant and equipment in 1947. Out of a total outlay of $2375 million, $1418 million or 59.7 per cent went for new machinery and equipment, $651.9 million or 27.5 per cent was invested in new construction and $304.7 million or 12.8 per cent was expended for used plant, used equipment and land.

Percentages vary somewhat for the six subdivisions of the metalworking industry, namely primary metals, fabricated products, machinery except electrical, electrical machinery, transportation equipment and instruments, but in all instances expenditures for new equipment exceeded outlays for new construction or used plant and equipment. Especially significant is the fact that expenditures for new machinery and equipment in 1947 were 419 per cent of corresponding allotments in 1939. —p. 32

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

LABOR— Expect increasing paralysis among steel-consuming industries over the next two weeks (pp. 29, 30) unless there is a quick end to the steel strike. Effects of the steel dispute would hit Detroit auto assemblies by Oct. 31. Problems are complicated by the Aluminum Co. of America strike and by the growing number of walkouts in steel fabricating plants organized by the CIO. The steelworkers alone have already dropped about $105 million in wages the three weeks they have been off the job. The White House will probably try another mediation attempt, but President Truman denies that he is considering taking over either the steel or coal industries.

PRICING—You'll have to wait at least until next year to get any congressional clarification of the pricing muddle (p. 31). The O'Mahoney measure to define how far industry can go in absorbing freight and quoting delivered prices is stymied until the second session of Congress. A compromise bill passed the House, but the Senate has deferred action.

CAPITAL EXPENDITURES—Metalworking's 1947 expenditures for plant and equipment totaled $2375 million, says the Census Bureau (p. 32). The industry's total allotments for new machinery and equipment in 1947 was 419 per cent of that allocated in 1939. New construction expenditures were 573 per cent of the 1939 total.

STANDARDIZATION— If you are becoming increasingly cost conscious, don't overlook the possibilities in standardization (p. 33). This is the advice given at the American Standards Association meeting in New York. Speakers at the convention believe that the average company has scarcely scratched the surface in applying standardization.

METAL SHOW—Many other ways for you to cut costs were shown at the Metal Show in Cleveland (pp. 34, 35). The exhibits at the exposition indicated that a close working partnership between the laboratory and the shop is responsible for many of the cost-saving, production-improving technological advances in American industry. A query of some of the show exhibitors reveals that a wide range of techniques are used to reduce expenses: Budget control, materials handling, employee education and co-operation, materials substitution, improved plant layout, better tooling, better production scheduling, improved production equipment.

SHIPBUILDING— Look for increased pressure for more American shipbuilding next year (p. 36). Military and naval officials will back the Bland omnibus bill which would amend the Merchant Marine Act of 1936 by applying the construction-differential subsidy to all vessels operated in the United States foreign commerce.

FOREIGN— Western European steel producers hope to benefit at least temporarily from the U. S. strikes (p. 39) . Western Germany and Belgium would welcome American sales to fill their partly empty order books. British and French steelmakers could divert some tonnage for coveted dollars.

HERE AND THERE IN INDUSTRY— Too much crude oil production in California may crimp sales of oil field equipment manufacturers there (p. 33) . . . Government pressure is mounting for more control of water pollution (p. 41) . . . Demand for metalworking products was swelled by the record 100,000 new nonfarm dwelling starts in September (p. 40) . . . Plans are under way for streamlining and improving collection of federal income tax and other tax withheld from employee wages (p. 38) . . . Large new market soon to be opened to metalworking is through mechanization of the cotton industry (p. 38) . . . Currency devaluations are bringing lower prices for welding electrodes and other products being marketed by North American Philips Co. Inc. . . . A new method of welding steel tubing has been developed by Ohio Crankshaft Co. and Yoder Co., both of Cleveland (p. 32).

Engineering News, p. 57 *Market Summary, p. 97*

A Report on the Steel Situation at Ryerson

As this is written,* a strike settlement is not in sight, but we're still able to furnish a fair share of most requirements from stocks on hand. Naturally, with heavy demand and the complete curtailment of supply, our stocks of some kinds and sizes have been sharply depleted. But every day we are filling hundreds of orders for carbon, alloy and stainless steels—and we will continue to fill orders, at our established prices.

Our technical men will make every effort to find workable alternates when the steel you need is not on hand. As always, you can be sure that Ryerson steels are of high, uniform quality. And you can depend on accurate cutting as well as prompt delivery.

When the strike ends (and we hope it will end before this appears), we will quickly rebuild our stocks so that every steel will again be available. In the meantime, we'll continue to do our level best to meet your requirements. So continue to call us when you need steel.

*Thursday, October 20

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • PITTSBURGH • BUFFALO • DETROIT • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO

STEEL
A PENTON PUBLICATION

Steel Inventories Dwindle

Next two weeks to bring many metalworking plant closings if steel strike continues. Industry expects federal intervention but President denies seizure plans

PARALYSIS in the steel-consuming industries will reach a crucial stage within two weeks if the steel strike continues. This is the appraisal of metalworking executives as they watch steel inventories dwindle after three weeks of idleness in almost 90 per cent of the industry's productive capacity.

Some metalworking plants already are down for lack of steel. Others are operating short shifts to conserve stocks. A large number will curtail or close early in November unless the flow of steel from mills to consumers is resumed.

Await Federal Intervention — Expectations that the President soon will move in an attempt to break the stalemate between the union and producers are heard wherever the strike is discussed. First move is expected to be another mediation attempt—at the White House level.

If top level mediation fails, the administration may prepare to seize the struck mills under the Selective Service Act, although President Truman says he has no plans for taking over either steel or coal industries.

Murray on Hook — Some action from the White House is anticipated before the national CIO convention opens in Cleveland next week end. CIO President Philip Murray will be in an unenviable position if he has to face the convention with a month-old strike on his hands and no prospects of settlement. His position will be made more untenable by the unpopularity of the current strike among the rank and file steelworkers. Nor will it be helped by the fact that his leading rival for power in the CIO, Walter Reuther, president of the United Auto Workers, has negotiated a pension settlement with Ford.

Stalemate Complete—As the third week of the stoppage ended, no weakening in the position of either side was apparent.

Steel producers stand ready to grant social insurance and pensions, but only on a contributory basis.

Union leaders are attempting to dress the drive for noncontributory pension and insurance as a crusade. Mr. Murray last week toured leading steelmaking centers to address strikers, promise an all-out victory and assure them that "God is on our side."

Federal conciliation and mediation chiefs are discouraged after 10 days futilely spent in talking with the steel companies and union officials.

Nine Alcoa Plants Struck

Strike of 16,000 members of United Steelworkers-CIO Oct. 17 closed nine of 25 plants of Aluminum Co. of America. Company's ingot output was cut 50 per cent.

The walkout does not affect extrusion operations at Cressona, Pa., and Lafayette, Ind., plants; ore processing at East St. Louis, Ill.; integrated melting and finishing operations at Massena, N. Y., including structural shapes, wire rod and bar mill output; magnesium foundry operations at Buffalo, die casting at Garwood, N. J. and Chicago, also permanent mold castings and forgings at Cleveland; diversified fabrication at Vernon, Calif.; sheet and plate output at Davenport, Ia.; furniture fabrication at Jamestown, N. Y.; basic aluminum reduction at Vancouver, Wash., and at Point Comfort, Tex.

Alcoa now has a noncontributory pension program to which it contributes 5 cents per man hour and an insurance plan for which it pays 2 cents. Company had offered to increase the benefits to 6 and 4 cents, respectively. However, the union flatly rejected company's proposal that the above offer be subject to future changes in "social security."

Strike Losses Mount

Directly or indirectly you are suffering losses from the steel, coal and aluminum strikes.

In the three weeks of the steel strike, 4,140,000 net tons of steel ingots have been lost. This total would have been produced if the industry had been operating at 86 per cent of capacity. Its operating rate now is only 9.5 per cent. This lost tonnage could have been converted to 3.1 million tons of finished products, worth $255 million or enough to build 2,480,000 automobiles. About 10 million tons of coal are being lost weekly because of the United Mine Workers' walkout.

An estimated 1 million are on strike today; the count is rising. Of this total, 500,000 are steelworkers, 400,000 coal miners, 16,000 Aluminum Co. of America employees, the rest in steel fabricating plants and miscellaneous categories. About 500,000 steel fabricating personnel belong to the United Steelworkers. Fabricating locals are beginning to strike.

Approximately 94,000 have been

. . . offered 6 and 4 but they struck at Alcoa's Edgewater, N. J., plant

furloughed by 36 railroads because of the coal and steel disputes. The number is mounting of nonstriking metalworking employees temporarily forced off the job or to a short week. Ultimately, all the 5.9 million metalworking employees could be affected.

Striking steelworkers have dropped $105 million in wages thus far. Coal miners are losing $30 million weekly. Uncle Sam is being hit, too, for he loses 20 cents in taxes for every dollar drop in the national income.

The effect of the coal and steel strikes is fanning out to people far afield. Retail merchants in areas predominantly coal or steel producing are being hard pressed. Community Chest drives have been postponed by several municipalities in the Youngstown-Pittsburgh region.

Strike Effects Spread

Steel and coal strikes are curtailing production at these companies:

General Motors Corp. is putting its entire automobile output on a four-day week. Elimination of Friday work is designed to stretch steel supplies until late November when the changeover to new models will begin.

Chrysler Corp. divisions have enough steel to maintain auto assemblies at the current rate until Oct. 31. At that time all divisions except Plymouth will start curtailing. Plymouth will probably be able to continue for a few days into November at the present pace.

Ford Motor Co. will have to shut down assembly lines Nov. 15 because of the coal and steel strikes. When the walkouts are settled, it will take Ford at least six weeks before it can resume full production.

Steel shortages forced Willys-Overland Motors Inc. to halt assemblies Oct. 10-24.

General Electric Co. has laid off 1700 because of steel shortages. If the steel strike continues, 6000 will be idle by Oct. 31 and refrigerator production by the company will practically cease.

Allis-Chalmers Mfg. Co. is starting to furlough 2500 because of inadequate steel supplies.

Thor Corp., which normally closes its Chicago plant for two weeks in December for inventory, will take inventory Oct. 31 because of the steel strike.

Westinghouse Electric Corp. will begin curtailing operations after Nov. 1 at its East Pittsburgh, Pa., and Mansfield, O., plants.

A Friend Indeed

LUKENS Steel Co. is issuing orders for food and fuel to employees in distress as a result of the steel strike.

"Lukens," says W. Roy Widdoes, the company's director of industrial relations, "is unwilling to see any of its employees in distress, and if families are in need of food or fuel the company will see that both are provided, to be paid for in the future."

Arrangements for food and fuel orders are being handled through George K. Irwin, supervisor of safety and personnel service.

Fabricating Picture Varies

The strike picture varies at the steel fabricating plants where the United Steelworkers have some 500,000 members. A few companies have settled—five more acceded to company-paid welfare demands last week. Some are being struck as contracts run out. The union, however, is bending over backward trying to extend as many fabricating contracts as possible, to give workers the chance to draw unemployment compensation when plants close for lack of steel.

Singer Strike Settled

The 24-week strike at Singer Mfg. Co.'s Elizabeth, N. J., plant is settled. The 7500 striking United Electrical Workers-CIO have accepted a contract which provides for no general wage increase and no abolition of the company's incentive pay system, the two main goals of the strike. This was one of the first walkouts in the nation for a fourth-round wage increase.

The contract is similar to one which ended a dispute three weeks ago at Singer's Bridgeport, Conn., plant. At that time Elizabeth union officials denounced the Bridgeport settlement as a "sellout."

Minimum Wage Bill Passed

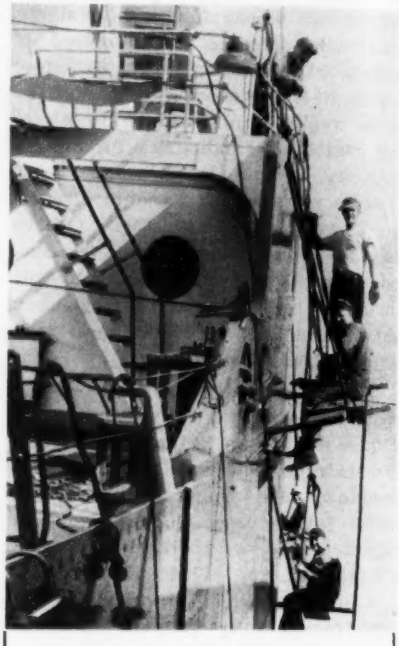
The minimum wage bill suported by President Truman squeezed through Congress last week just before adjournment. The measure raises the minimum wage to 75 cents an hour from 40 cents. Some 1.5 million workers will get boosts.

Armco, Independents Sign

A social insurance program costing slightly less than seven cents an hour has been worked out by Armco Steel Corp. and its Employee Independent Federation. The company has agreed to pay 60 per cent of the cost of the program, with the individual employee paying 40 per cent. Any dividends accruing from the insurance will be shared by the company and the employee on this basis. Armco has only two plants which have contracts with the CIO union.

Bell Aircraft Workers Back

Representatives of 1700 striking CIO United Auto Workers and officials of Bell Aircraft Corp. reached an agreement to end a bitter dispute which has halted production at Bell's Niagara Falls, N. Y., plant for 18 weeks. All matters in dispute will be submitted to a New York State board of inquiry for arbitration.



MAKING THE MOST OF IT: Idled by the steel strike, this ore carrier, like many others, is undergoing minor repairs—in this case a coat of paint. NEA photo

Shareholders Want Say

Demand that any pension and insurance grants to employees of struck steel companies be submitted first to stockholders is facing the management of at least two large producers.

Henry F. Holthusen, New York attorney, in letters to the presidents of Inland Steel Co. and Youngstown Sheet & Tube Co., questions the power of management to make such grants without consent of shareholders.

"Regardless of what might be the answer to these union demands, we shareholders are entitled to speak. Perhaps a majority of the shareholders favor these insurance and pension plans. Perhaps they do not. They, surely, have power to say 'yes' or 'no.' They should be granted the opportunity to say so at a stockholders' meeting."

Pricing Bill Stalled

O'Mahoney measure passes in House but is held up by Senate until January

THE O'MAHONEY bill to clarify how far industry can go in absorbing freight costs and quoting delivered prices is stalled until next year.

The bill, in compromise form developed in a House-Senate conference committee, passed the House 200 to 104, but the Senate has deferred action on it until next Jan. 20, when the 81st Congress will be in its second session.

The postponement resulted largely from persuasive action by Senators Paul H. Douglas (Dem., Ill.), Russell B. Long (Dem., La.), and Joseph C. O'Mahoney (Dem., Wyo.), particularly the first-named.

Cites Objections—The bill in the form agreed on by a House-Senate conference committee and passed in that form by the House would, says Senator Douglas, bring "re-establishment of the old basing-point system with the addition of two other possibilities, zone pricing and postage-stamp pricing, so that the leading firms in an industry would have a whole armory of weapons.

"They are protected by this bill against suits by the government, and they can say 'we are doing this independently merely to match the prices of our competitors,' with the result that competitive prices will disappear."

Fears Discriminatory Pricing—Section 3 of the bill, he asserts, "would repeal the Robinson-Patman Act by permitting a seller to make, and a buyer to receive, a discriminatory price not granted to others, provided only that it is made 'in good faith to meet an equally low price of a competitor.' "

This view is mirrored also by government attorneys, who say that the bill, as it came from conference, "would remove the Federal Trade Commission from jurisdiction over pricing."

Scope Broadened—The bill that came from conference and passed the House is far broader than what its original proponents had in mind. Key change was substitution of the word "will" for "may." As a result the final bill recognizes the right to absorb freight, when done independently, "except where such absorption of freight would be such that its effect upon competition will be to substantially lessen competition."

The bill provides that proof of meeting competition in good faith is an adequate defense against charges of price discrimination, except in conspiracies, and that charges of lessened competition due to price discrimination must be proved by "reliable, probative and substantial evidence." This contrasts with the present system under which courts uphold the orders of the FTC on the basis of any evidence as to what the effect of discrimination "may be."

Time Extended in Pricing Suit

Time limit for filing briefs on respondents' motion to dismiss the Federal Trade Commission's suit against steel companies for using a multiple basing point and delivered price system is postponed again, this time until Oct. 27. The commission granted postponement at request of the American Iron & Steel Institute.

Ceco Holds Cicero Open House

"GOOD NEIGHBOR" is the term applied to Ceco Steel Products Corp. by many of the townspeople of Cicero, Ill. They had their first opportunity to visit the company's main plant in that Chicago suburb Oct. 15. Personal invitations were extended to householders for several blocks around the plant and city officials were also invited. Ceco makes steel casements, roof deck, joists, metal lath and combination storm sash at this plant.

Leaves Metal Treaters' Group

STEWART N. Clarkson has resigned as executive secretary of the Metal Treating Institute, New York, effective in 90 days. A three-member committee including the institute's president, Fred Heinzelman Jr., is empowered to select a successor.

Iron Ore Stocks High

IRON ORE consumption dropped to 5,541,187 gross tons in September and stocks at Lake Erie docks and furnaces rose to 45,356,369 tons on Oct. 1, highest total for this year and surpassing stocks at the end of the 1948 shipping season. Consumption in September was lower than in any month this year except July and more than 1.4 million tons below the 6,965,392 tons consumed in September, 1948.

Lake Superior Iron Ore Association, Cleveland, totals show that stocks increased more than 4.5 million tons during September. Month ago and year ago stocks were 40,811,232 tons and 40,923,499 tons.

Steel Ingot Production Statistics

	Estimated Production—All Companies									
	Open Hearth		Bessemer		Electric		Total		Calculated weekly production Net tons	Number of weeks in mo.
	Net tons	Per Cent of capac.	Net tons	Per Cent of capac.	Net tons	Per cent of capac.	Net tons	Per cent of capac.		
1948										
Jan.	6,770,831	95.6	343,263	77.5	366,784	80.2	7,480,878	93.7	1,688,686	4.43
Feb.	6,247,491	94.4	340,689	82.3	359,837	84.2	6,948,017	93.1	1,678,265	4.14
Mar.	6,845,777	96.6	363,334	82.0	409,659	89.6	7,618,770	95.4	1,719,813	4.43
1st qtr.	19,864,099	95.5	1,047,286	80.6	1,136,280	84.7	22,047,665	94.1	1,695,974	13.00
Apr.	5,640,273	82.2	185,140	43.2	399,074	90.1	6,224,487	80.5	1,450,929	4.29
May	6,801,633	96.0	355,659	80.3	423,350	92.6	7,580,642	94.9	1,711,206	4.43
June	6,484,114	94.5	356,907	83.2	424,228	95.8	7,265,249	94.0	1,693,531	4.29
2nd. qtr.	18,926,020	91.0	897,706	69.0	1,246,652	92.8	21,070,378	89.9	1,619,552	13.01
1st 6 mos.	38,790,119	93.3	1,944,992	74.8	2,382,932	88.8	43,118,043	92.0	1,657,749	26.01
July	6,348,611	89.8	325,080	73.6	401,826	88.1	7,075,517	88.8	1,600,796	4.42
Aug.	6,633,443	93.6	371,306	83.8	442,085	96.7	7,446,834	93.3	1,681,001	4.43
Sept.	6,594,499	96.3	387,259	90.5	443,086	100.3	7,424,844	96.2	1,734,777	4.28
3rd. qtr.	19,576,553	93.2	1,083,645	82.6	1,286,997	95.0	21,947,195	92.7	1,671,530	13.13
9 mos.	58,366,672	93.2	3,028,637	77.4	3,669,929	90.8	65,065,238	92.2	1,662,372	39.14
Oct.	7,120,753	100.5	409,657	92.5	466,485	102.0	7,996,895	100.1	1,805,168	4.43
Nov.	6,925,043	100.9	411,161	95.9	461,354	104.2	7,797,558	100.8	1,817,613	4.29
Dec.	6,927,689	98.0	393,717	89.1	459,373	100.7	7,780,779	97.7	1,760,357	4.42
4th qtr.	20,973,485	99.8	1,214,535	92.5	1,387,212	102.3	23,575,232	99.5	1,794,158	13.14
2nd 6 mos.	40,550,038	96.5	2,298,180	87.5	2,674,209	98.6	45,522,427	96.1	1,732,867	26.27
Total	79,340,157	94.9	4,243,172	81.2	5,057,141	93.7	88,640,470	94.1	1,695,495	52.28
1949										
Jan.	7,287,683	101.1	408,552	92.6	487,260	93.8	8,183,495	100.2	1,847,290	4.43
Feb.	6,633,779	102.0	379,698	95.3	467,247	99.6	7,480,724	101.4	1,870,181	4.00
Mar.	7,473,901	103.7	430,176	97.5	483,850	93.2	8,387,927	102.7	1,893,437	4.43
1st qtr.	21,395,363	102.3	1,218,426	95.2	1,438,357	95.4	24,052,146	101.5	1,870,307	12.86
Apr.	7,015,611	100.5	404,095	94.6	365,570	72.7	7,785,276	98.4	1,814,750	4.29
May	6,889,230	95.6	400,741	90.9	299,751	57.7	7,589,722	92.9	1,713,256	4.43
June	5,954,619	85.3	349,196	81.8	194,386	38.6	6,498,201	82.2	1,514,732	4.29
2nd qtr.	19,859,460	93.8	1,154,032	89.1	859,707	56.4	21,873,199	91.2	1,681,260	13.01
1st 6 mos.	41,254,823	98.0	2,372,458	92.1	2,298,064	75.8	45,925,345	96.3	1,775,236	25.87
*July	5,307,471	73.8	300,236	68.2	171,415	33.1	5,779,122	70.9	1,307,494	4.42
*Aug.	6,101,500	84.7	355,335	80.6	257,910	49.7	6,714,745	82.2	1,515,744	4.43
†Sept.	5,978,592	85.9	350,356	82.2	243,336	48.5	6,572,284	83.3	1,535,580	4.28
†3rd qtr.	17,387,563	81.4	1,005,927	77.0	672,661	43.7	19,066,151	78.8	1,452,106	13.13
†9 mos.	58,642,386	92.4	3,378,385	87.0	2,970,725	65.0	64,991,496	90.4	1,666,449	39.00

* Revised. † Preliminary figures subject to revision.

For 1949, percentages of capacity operated are calculated on weekly capacities of 1,626,717 net tons open hearth, 99,559 net tons bessemer and 117,240 net tons electric ingots and steel for castings, total 1,843,516 net tons; based on annual capacities as of Jan. 1, 1949, as follows: Open hearth 84,817,040 net tons, bessemer 5,191,000 net tons, electric 6,112,890 net tons, total 96,120,930.

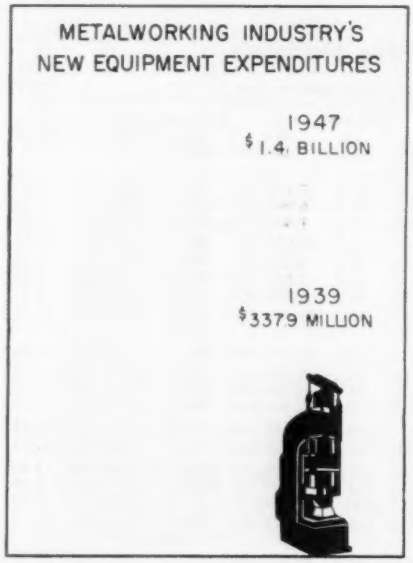
Capital Expenditures Up

For metalworking industry in 1947, total $2375 million, says Census Bureau

METALWORKING industry's expenditures for plant and equipment during 1947 totaled $2375 million, says the Bureau of Census.

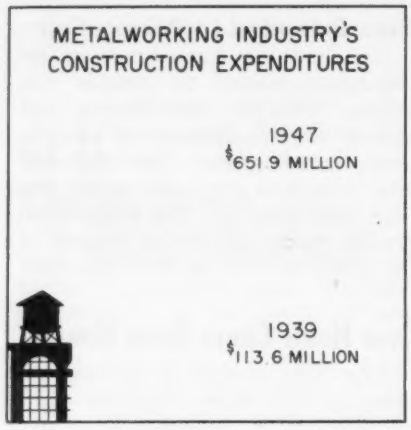
Of this sum, $651.9 million or 27.5 per cent was invested in new construction, $1,418,300,000 or 59.7 per cent in new machinery and equipment and $304.7 million or 12.8 per cent in used plants, used equipment and land. The complete breakdown of the six metalworking classifications in the accompanying table shows that primary metal industries spent the most in 1947, manufacturers of instruments and related products the least. Although primary metal expenditures were the highest, this category's employment is exceeded by two other groups—machinery, except electrical, and transportation equipment.

The metalworking industry's total expenditures for new machinery and equipment in 1947 were 419 per cent of that allotted in 1939, as shown:



Of the metalworking groups, electrical machinery makers spent nearly six times as much on new machinery and equipment in 1947 as in 1939. Transportation equipment manufacturers spent only three times as much in 1947 as in 1939.

The metalworking industry's expenditures for new construction in 1947 were 5.73 times those of 1939, as the chart indicates.



Among the metalworking groups, electrical machinery producers allotted 12 times as much for new construction in 1947 as in 1939. Instrument makers spent only three times as much.

There were marked variations in the 1939-1947 increase in capital expenditures among the various geographic regions. For the highly industrialized New England, Middle Atlantic and East North Central areas, the increases averaged only 335 per cent, compared with the national average of over 380 per cent. For the South Atlantic and East South Central regions, the percentage increase in expenditures approached 400 per cent. In the West gains were from 500 to 580 per cent.

Tunnel Nears Completion

WORK on the two-mile tunnel connecting loading docks on the Monongahela river with the new Weirton mine near Morgantown, W. Va., is entering the final stage. The mine will produce coal for metallurgical use by Weirton Steel Co., National Steel Corp. subsidiary, starting early in 1950.

Boring operations on the tunnel were started last March by two crews working toward each other from opposite ends. The break through is complete and work will begin soon on installation of the belt conveyor for coal haulage and a parallel mine car track for maintenance and inspection of conveyor tunnel and for delivery of maintenance supplies to river docks.

Conveyor will be a single unit 10,000 feet in length from head to tail pulleys. It will be driven by one 200-hp electric motor with no intermediate drive or transfers. Specially designed conveyor belt will be 30 inches wide, of steel cord construction.

Domestic Tool Orders Up

IMPROVEMENT in domestic orders for machine tools in September was greater than the decline in foreign orders and caused the new orders index of the National Machine Tool Builders' Association to advance to 57.7 from 51.5 in August. The foreign orders index dipped to 13.7 in September from 18.8 a month earlier and established a new low for the year. Foreign currency devaluations were a big factor in the decline.

September shipments advanced fractionally to 67.6 from 67.3 in August. Ratio of unfilled orders to shipments was 3.7 to 1, compared with 3.8 to 1 a month earlier.

Association's indexes are based on average monthly shipments in 1945—1947 equaling 100. Average annual shipments in the base period were $355 million.

High Speed Tube Welder Shown

PRODUCTION steel tube welding at a rate of 200 ft per minute is achieved with a high frequency induction process developed by Ohio Crankshaft Co. and Yoder Co., both Cleveland concerns. Developed after 18 months of co-operative research the process had its first showing at the National Metal Show.

Ohio Crankshaft developed the heat application and Yoder worked out the mechanical system of moving tubing. Metal is fused at temperatures between 2300 and 2600° F with only $\frac{3}{16}$-inch of metal on either side being subjected to 10,000 cycle heating.

First production model is expected to be in operation in January. Currently the system will work only with low carbon steel tubing. It will eventually be applied to nonferrous metals and stainless steel.

Metalworking's 1947 Plant, Equipment Expenditures

Dollar figures in millions.

	Primary Metals Indus.	Fabricated Products	Mach'y except Elec.	Elec. Machinery	Transportation Equip.	Instruments, etc.
Total expenditures for new plant and equipment	592.2	304.8	517.6	244.6	355.0	56.0
New construction total	212.7	92.1	167.4	64.9	99.5	15.3
Buildings	126.4	82.5	153.5	58.6	87.0	14.6
Other	86.3	9.6	13.9	6.3	12.5	0.7
New mach'y-equip. total	379.5	212.7	350.2	179.7	255.5	40.7
Production	351.2	189.0	306.8	155.8	222.1	34.9
Other equipment	28.3	23.7	43.4	23.9	33.3	5.8
Used plant, equipment, land	77.7	27.5	80.7	31.5	77.6	9.7
TOTAL EXPENDITURES	669.9	332.4	598.3	276.1	432.6	65.7

A Way To Cut Costs

Standardization offers almost unlimited field in which to effect economies

LOOKING for ways to cut costs? Look then at the possibilities that standardization may hold for you. The field is almost unlimited. This was emphasized at the 31st annual meeting of American Standards Association in New York.

Whether the standardization be in materials or methods the aim is the same—avoidance of the cost of duplication.

The Problem—Focusing attention on this point, V. de P. Goubeau, vice president in charge of the materials department, RCA Victor Division, Radio Corp. of America, exclaimed: "How many companies are struggling with an unwarranted variety of similar products; warehouses loaded with tools, jigs and fixtures instead of stock; staffs handling personnel and setup and knockdown personnel spending more time on production equipment than the production operators themselves; customers yelling for delivery and better prices!"

Costly Duplication—Drawing on his field of work—procurement—for an example, Mr. Goubeau says that one place where standards have paid off handsomely to both manufacturer and user is in the use of a "preferred types" practice. "With the rapid advancement in electronics, tube types pyramided. In tube manufacturing, the problem of serving all customers, many with small quantity requirements of a large number of different types, became untenable," he points out. As a result "too great a variety of raw materials had to be procured, each in small uneconomical quantities; too much factory space was required for a vast collection of facilities; too much time and expense were involved in setups for short runs."

Now for the solution: "From the total, a careful selected small list of 'preferred types' was developed," Mr. Goubeau explains. "We can now manufacture more efficiently for customers' schedules and for stock. Our production rate on preferred types is more uniform because of long runs and smaller demand for other types. Fewer types mean better delivery and insure uninterrupted production of electronic equipment in customers' plants."

Sees Big Opportunities—From this and other experience with the application of standards Mr. Goubeau is convinced the full use of all applicable standards may go a long way towards the assurance of an acceptable product at a competitive price.

Indicative of the broad field in which standards can be applied is the report on plant construction standardization by W. H. Kiler, Standards Section, E. I. du Pont de Nemours & Co. Inc. "Postwar, with rising construction costs and the shifts from a buyers' to a sellers' market and now back again, the importance of standardization to industrial construction becomes increasingly important as a means to make it possible to purchase a better product at lower cost," Mr. Kiler asserts.

"Probably specification writing pays the greatest return for the effort expended. Standard specifications with which suppliers and construction contractors can become familiar will reduce costs," he believes.

MERE 15 TONS: This industrial truck made by Automatic Transportation Co., Chicago, is capable of handling loads up to 110,000 pounds. Demonstration load of a highway trailer loaded with four Oldsmobiles is a small job for the electric truck. Oldsmobile Division of GM will use it to handle huge automotive dies

Too Much California Crude Oil

SUPPLIERS of pipe, tanks, and equipment to California's petroleum industry are as concerned as oilmen themselves over authoritative warnings that the industry in this state is seriously overproducing crude oil.

How severely this overproduction and subsequent cutbacks may affect the steel and metalworking industries cannot yet be predicted, but there will be definite repercussions, for makers of oil country goods comprise one of California's largest industries.

Standard Oil Warns—Latest warning against the critical implications of continued heavy unbalance between supply and demand was sounded by T. S. Petersen, president of Standard Oil Co. of California. He pointed out that the unsold accumulation of more than 24 million barrels of crude since the start of 1949 has placed an unwieldy stock burden on oil companies of all sizes.

As a result of overproduction, he said, inventories in Pacific Coast petroleum areas increased during the first quarter at the rate of 35,000 barrels daily, in the second quarter at the rate of 135,000 barrels daily, and during July and August at the rate of 144,000 barrels daily.

Causes of Over-Supply—"Over-supply has been caused by a combination of circumstances," Mr. Petersen said. "Accelerated development to meet immediate postwar demand created a high production level. But demand this year has been curtailed by reduced export and military requirements, decreased maritime activity, dieselization of railroads, and large imports of natural gas. The problem first made itself felt in surpluses of heavy fuel oil, but excess output is now increasingly apparent in lighter products as well."

Although it is the second largest oil producing state, California has no petroleum conservation law. In another important petroleum area, Texas, production is controlled and has been cut back. While output has been reduced in some California fields, total production for the state has remained considerably above requirements.

Lab-Shop Teamwork Seen at Metal Show

Cleveland exposition demonstrates that America's dominant industrial position is supported by close partnership between science and working practice

OUTSTANDING impression gained from the 1949 Metal Congress & Exposition is that America holds its dominant position in the industrial world because a close working partnership exists between science and practical ingenuity. This was proved by numerous instruments, machines and other equipment on display, wherein basic principles not long out of the research laboratory now are practical working tools involved in the constant drive for economy in production.

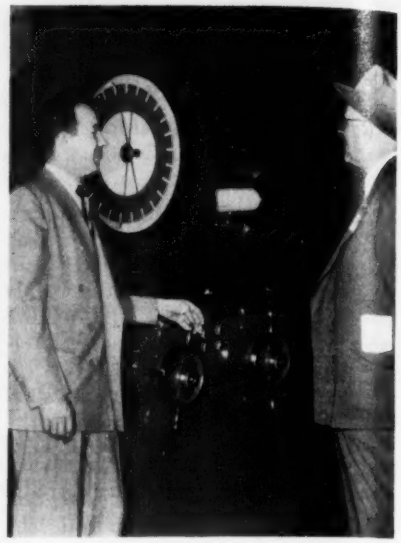
Anyone who questions the propriety of science penetrating into the shop should recall that less than 25 years ago gas and electric welding —and their companion technique, flame cutting—were considered by more conservative industrialists to be of doubtful practical value. Many a Doubting Thomas has lived to see gas and electric welding bring about a veritable revolution in the design and construction of metal products ranging all the way from small drilling jigs to huge drilling rigs.

Technological Advance Held Essential—Industrialists today are inclined to be far less skeptical of scientific innovations for two reasons: They have been mentally conditioned by such revolutions in shop practice to realize that many other swift and sweeping changes are possible and probable at any moment; having seen the effect of technological changes in the recent past, they want to be sure that changes sweep them ahead, but not over the dam.

The 1949 Metal Show emphasized above everything else that economy in production depends largely on elimination of wasted materials and wasted time. The number of exhibitors who demonstrated ways and means of getting metal into manufactured parts instead of into the scrap bin was particularly impressive. In the realm of metal conservation can be classed the displays of parts produced by forging, stamping, extruding, die and other precision casting processes and from tubing and rolled shapes; of machines for producing, heat treating, finishing and fabricating such parts and materials; and of finished assemblies made up of such parts.

Industry Must Keep Up with Times—Repercussions of new inventions, the use of unusual materials, new methods of heat treating reach further into the vitals of industry today than they ever did in the past. The rapidly growing use of pressed metal nuts and related fastenings, for instance, has put punch presses into direct competition with screw machines, upsetting machines and threading machines. At the same time it has put strip steel into direct competition with rods, bars and coiled solid stock. Smart industrialists at the show were giving serious thought to means for meeting such eventualities—either by finding new uses for their materials and machines or by swinging over to other forms of materials and other types of machines in tune with the times.

Mechanization Is Byword—The extent to which non-destructive testing machines, flame hardening machines, induction hardening machines, polishing machines and cleaning machines have been mechanized is one of the great signs of the times. Pictures on this page taken by STEEL's photographer show some of the typical cost-saving, production-improving machines on display at the exhibition.

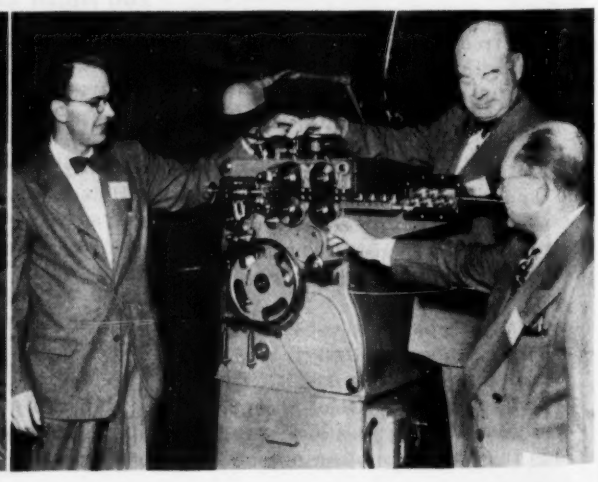


Attraction: Tensile testing

For some reason American ingenuity excels when it comes to designing built-in work holding and conveying devices and in tying these in with the machining or heating or other process through time cycle control. The conclusion to be drawn is that labor costs have reached the point where the machine which loads itself, carries through its functions automatically, and unloads itself, is one of the prime answers to the problem of holding the line on production costs. Not so long ago that was true only in big lot production. Today it holds for medium and small lots.

Aid to quality control: Porosity-free welding

Spring forming machine—they find it versatile



How Are You Cutting Costs? Executives at Metal Show Give You Their Answers

WIDESPREAD interest in cost savings sent STEEL's editors to the Metal Congress & Exposition to ask: What are you doing to cut costs? Here's what representative company executives have to say.

William B. Given Jr., president, **American Brake Shoe Co.,** New York: Since mid-1948, we have been attempting to raise our "per unit" output by educating our employees. This is being done in all our 58 plants through the foremen's instilling team spirit in those under him.

We have the mechanized end of manufacturing to a point where costs are held to a minimum. Further cost cutting to meet competition can come only through personnel who feel they are on the team.

Our method of attaining this goal is via an information center which all foremen will attend. These men meet and talk with all officials and are given frank answers to questions.

William Adam Jr., vice president, **Ajax Electric Co.,** Philadelphia: We make it a practice to look over carefully anything in the line of equipment that may serve our purposes. We are constantly on the lookout for anything that reduces overhead.

The furnace business is still a custom operation. We have a high overhead in form of trained personnel—personnel that cannot be discarded when sales drop. Therefore as furnace sales decrease cost of manufacture increases. This March we moved into a new plant which consolidated operations. In one bay, we expedited operations with a handling system that uses either a 5, 10 or 15-ton crane in moving materials over an indoor railroad siding.

N. C. Miller, president, **Miller Electric Mfg. Co.,** Appleton, Wis.: An incentive program and good employer-employee relations are our means of holding production costs down.

Our employees are kept closely informed of the company's affairs. Result: Employees and employer trust each other.

A satisfied worker is a better worker. A better worker gives higher production. Under an incentive plan this higher output means more take-home pay for the employee and lower units costs for the company.

A. J. Turpin, chief engineer, **Hanick Mfg. Co.,** Brooklyn, N. Y.: Better tooling, better production scheduling, improved storage and handling equipment afford us our major cost-saving opportunities. Reduced pressure for production is really a Godsend from the cost standpoint. Only now have we the time needed to study cost-saving possibilities and to experiment with them. This study and experimentation has enabled us to move a machine here, modify a process there in dozens of small ways which add up to surprisingly large savings.

A. F. Jackson, executive vice president, **Lake City Malleable Co.,** Cleveland: Daily supervision of costs and budgets is one major method of cutting our costs. We find it essential to work with our men to educate them in productivity, control of waste and general efficiency.

J. J. Whitenhafer, Columbus Division manager, **Lake City:** Another important way we cut costs is through redesign of our product, by reducing its weight, by increasing strength through structural changes and other means.

A. Bollerman, president, **Pyrometer Instrument Co. Inc.,** Bergenfield, N. J.: We are in an enviable position because our production methods are as efficient as we can make them.

Despite higher operating costs, including doubled salaries, we as an instrument company have been able to maintain prewar prices.

We have done this by taking advantage of modern techniques. We had our costs scaled down to the bone before the war. Then through increased production realized by assembly-line procedures we offset labor costs.

Norman C. Bloye, vice president, **Hevi Duty Electric Co.,** Milwaukee: In producing furnaces, we are eliminating hand labor wherever we can. We are doing this by redesigning our products and getting as many components as possible on a repetitive basis.

Here's how: We found we could cut costs by getting away from square shaped furnaces. We discovered that by literally cutting corners from some of our laboratory type furnaces, we also could cut production costs—not to mention savings in heating efficiency.

We also are making many interchangeable parts.

L. V. Nagle, vice president, **Udylite Corp.,** Detroit: One thing we have done is to set up an organization-wide budget control system. Besides heads of departments in the plant including foremen, the setup encompasses all branch offices.

By making our people cost conscious through budget control we have been able to make savings that even benefited our customers — savings that range from 5 to 10 per cent. Operating costs also have been lowered through standardization.

We also were successful in finding new lower cost materials for plating barrels. Not only have these materials provided superior performances, but they have enabled us to pass on a 20 per cent savings to customers.

H. A. Stearns, manager of industrial instrument sales, **Brush Development Co.,** Cleveland: Our manufacturing costs are coming down because our production is increasing. A switch to die casting a cabinet, for instance, has meant substantial cost reductions. We have learned, too, that savings can be realized by subcontracting some of our work.

Mrs. Florence M. Sayle, president, **Cleveland Punch & Shear Works Co.,** Cleveland: Any improvement to metalworking machinery which makes it easier and safer to operate helps users cut costs. One of our contributions is a clutch-brake unit, now standard equipment on new presses and applicable to machines in the field.

This drum-type unit gives instantaneous stopping and starting, and exact "inching" at the touch of a button. If air pressure falls or electric current fails, the clutch lets go and the brake stops the press.

Leighton A. Wilkie, chairman of the board, **Do-All Co.,** Des Plaines, Ill.: Economists believe that an 8 per cent improvement in productivity of American industry will bring about the much discussed era of plenty-for-all by 1960.

Simplification of design and use of our own contour sawing machines for cutting frame details for welded construction are among the many things which keep the cost of our machines at a level where users can afford them.

No Cure for Corns

YOU walked two miles if you just glanced at the 375 exhibits at the Metal Show. How long did it take? About two hours if you walked casually and didn't stop to look closely at the $6 million worth of new machinery and equipment, a full working day if you had really wanted to "do the show." The displays were spread over five and a half acres. An estimated 60,000 persons viewed them.

Windows of Washington

By E. C. KREUTZBERG — *Washington Editor, STEEL*

Growing awareness of keeping the nation's shipbuilding industry alive by encouraging new construction is indicated. Joint Chiefs of Staff herald importance to national defense

AMERICAN shipbuilding may get some encouragement next year.

Although shipyards were rebuffed when House-Senate conferees killed an appropriation of $25 million to repair 134 ships in the Maritime Commission's mothball fleet—as start of a program to repair 439 merchant vessels—the program is being pushed by the Joint Chiefs of Staff. They say it is necessary for the national defense. There is increasing recognition in Congress of the need for keeping the industry alive, a growing awareness that construction of ships needs encouragement.

Obsolete Ships—This is the theme of a report filed by a Senate subcommittee. It points out that the war-built merchant fleet is becoming obsolete and "a replacement program of new ship construction may be in order." The report points up increasing foreign competition since the war. Foreign shipyards are enjoying a boom, particularly those of the United Kingdom and Sweden. Shipbuilding and ship repair in this country "is again in the doldrums," says the report, and a planned program for repairing vessels in the reserve fleet is imperative.

Shipbuilding and ship repair will come up for legislation next year, the former when the Bland omnibus bill is taken up. As reported Oct. 11 by the House Merchant Marine and Fisheries Committee after a nine-month study, it would amend the Merchant Marine Act of 1936 by applying the construction-differential subsidy to all vessels operated in United States foreign commerce, not only to vessels plying in designated trade routes with operating subsidy assistance.

Liability Shift—An important provision of the Bland bill called for by the shipping industry is that which limits liability on new ships: When an operator purchased a ship under the construction-differential subsidy contract, the government would take a first mortgage; liability of the operator would be limited to that first mortgage, and there would be no proceeding to collect against his other assets. Ships purchased under the Bland bill would be of Navy-approved design and eligible for subsidies in consideration of national defense features such as speed. Operators would benefit from tax incentives provided in the bill. As amended by the committee, the Bland bill would provide government assistance for modernization of vessels in the Great Lakes and St. Lawrence waterway.

Cold-Worked Steel Investigated

ORDNANCE Department's investigation of cold-worked steels has been broadened considerably since it was launched in 1947. Results, when available, will be of vital interest to steel consumers—particularly designers of steel products.

Here's the object in a nut shell: To determine the extent to which cold-worked steels may be used as substitutes for high-alloy steels or steels which must be heat-treated.

If cold-worked steel proves to have hoped-for characteristics, there should be a saving in machining time and equipment through cold drawing or cold extruding steel to final shape and finish dimensions.

Testing Phase Now Covers Bars, Tubes—Test data being compiled cover: Effects of cold working on significant properties and characteristics, effects of sub-zero temperatures, aging, and other factors on strength, ductility, impact resistance and endurance of cold-worked steels. The present phase involves bars and tubes. Bars are supplied by Union Drawn Steel Division, Republic Steel Corp., and tubes by Babcock & Wilcox Co., Beaver Falls, Pa. Bars are of four compositions—SAE 1016, 1040, 4615 and 4640. Tubes are of two compositions—1040 and 8630. The bars are cold drawn with total reductions ranging from 6 to 80 per cent without any intermediate heat treatment. Tubes are drawn to total reductions of 10 to 65 per cent.

Tests are being conducted by the Case Institute of Technology. Results are being studied by the Watertown Arsenal laboratory staff. Results will be correlated with those obtained from the Ordnance Department's recently completed basic study on cold-extruded steels. The arsenal laboratory staff plans to begin preparation next year of a manual covering possibilities and limitations in the use of cold-drawn, cold-rolled and cold-extruded steels, and indicating precautions to be observed in their use. The manual is to be distributed among ordnance designers.

Hearings on Monopoly Problems

PHASES of the monopoly problem to be addressed by the Celler subcommittee of the House Judiciary Committee when it resumes hearings on Oct. 25, are:

Should fines for criminal violations of antitrust laws be increased? Is legislation on jail sentences desirable? Should procedure on triple damages be simplified? Should government be allowed to sue for damages to itself? Should damages be less than triple at court's discretion? Can antitrust laws be made less cumbersome? In what ways are patent laws inconsistent with antitrust laws? Is procurement policy legislation needed to protect small producers? What features of tax laws and regulations are inconsistent with antitrust policies? Can tax laws be made to act as inducement to limit or reduce concentration? Are results of the Reed-Bulwinkle Act compatible with the intent of Congress? Does the Webb-Pomerene Act unfavorably affect internal free enterprise?

Among invited witnesses are several "prominent" business leaders.

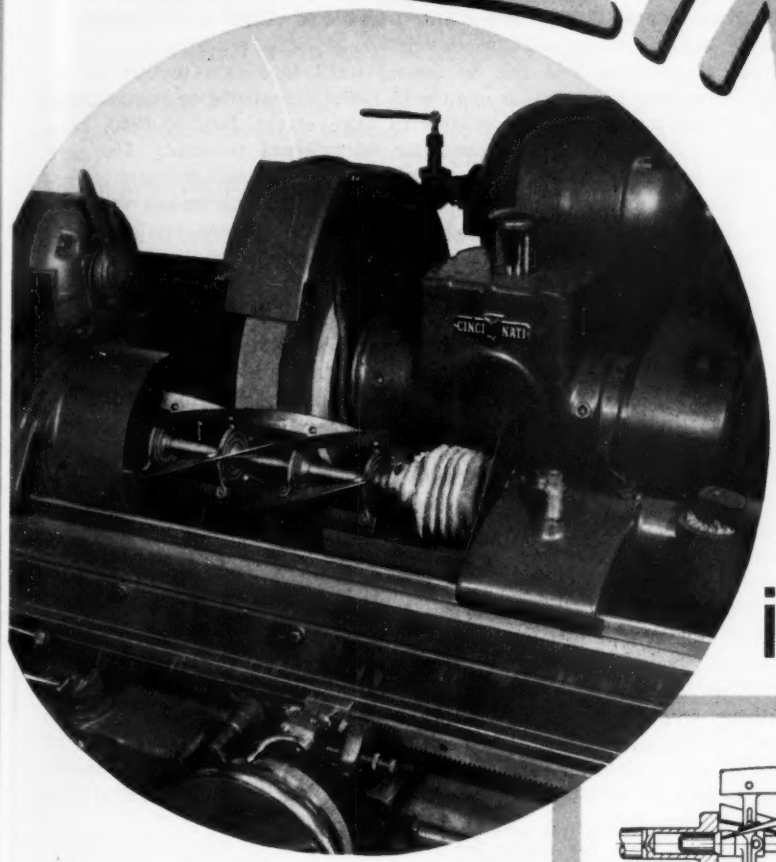
FCC Clinic on Radio Interference

METALWORKING industries have expressed little interest in a conference expected to lead to eventual redesign of much electrical equipment.

So far only two large companies have signified their intentions of being represented at a conference to be held by the Federal Communications Commission Nov. 1. This indifferent attitude arouses surprise because the meeting will serve as a clinic for discussion of radio interference from all electrical equipment not yet covered by FCC regulations. The number of devices in question runs into the thousands. They include electric motors, switches, toasters, washing machines, elevators, electric induction heating equipment, welding apparatus—to mention only a few. One company alone makes 150 different products to be considered.

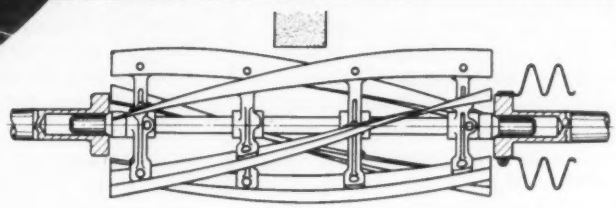
"It is not proposed to throw any of these manufacturers out of business," a commission staff member told STEEL. "But a real problem is present due to rapidly increasing congestion in the usable radio frequency spectrum. New radio uses are developing rapidly—so that it becomes

-ZING

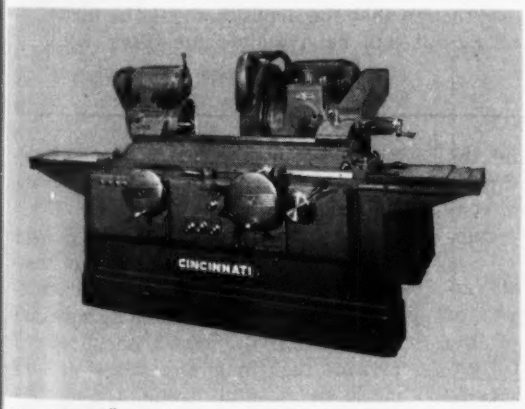


and another lawn mower reel is finished ground

Several sizes of lawn mower reels are ground on this CINCINNATI 10"-L x 30" Plain Hydraulic Grinding Machine. The footstock has 3⅞" spindle retraction for the purpose of supporting the reel on its bearing cones, between female centers. Production varies up to 75 per hour, removing .010" for the finish grinding operation.



Drawing shows how the reel is supported between centers.



CINCINNATI 10"-L Plain Hydraulic Grinding Machine. Complete specifications may be obtained by writing for catalog G-566.

Take a tip from lawn mower people when selecting a machine for light cylindrical grinding operations. Choose the required machine size, say 10", which has the power and mass rating of the next smaller size. Then you will have sufficient power at the grinding wheel plus extra swing over the table for the largest diameter of the part. That's the formula used by lawn mower manufacturers in selecting CINCINNATI FILMATIC 10"-L Plain Hydraulics for the cylindrical grinding operation illustrated here. But the things that really counted most in their selection were Cincinnati's dependable low cost performance, rapid production, and efficient, reliable service organization. ¶ FILMATIC spindle bearings—an exclusive Cincinnati feature—and automatic filtered lubrication are big factors of dependability in these machines. Unit type construction keeps down maintenance expense. Other features are described in an attractive catalog. Write for a copy.

CINCINNATI GRINDERS INCORPORATED

CINCINNATI 9, OHIO, U. S. A.

CENTER TYPE GRINDING MACHINES • CENTERLESS LAPPING MACHINES • CENTERLESS GRINDING MACHINES

imperative to keep interference in all wave bands at a minimum.

"It is clear that as time goes on the commission may be forced to set maximum interference standards for all these different types of apparatus which come under the head of 'incidental radiation devices.' An ultimate effect may be the redesign of many present electrical products to achieve a realistic balance between the interference potential of such devices to authorized radio services, on the one hand, and practicality of design on the other."

At this meeting an attempt will be made to lay the groundwork for setting up a standard to measure radio interference from these incidental sources. The commission intends to build future rules around such a measuring standard.

Large Metalworking Market

LARGE NEW market on the verge of being opened to the metalworking industries is through mechanization of the cotton industry.

This goal, Department of Agriculture engineers say, is a step nearer as a result of research work in 15 southern states under the Research and Marketing Act of 1946. Aim is complete mechanization of all phases, from disposal of crop residue, through preparation of the seedbed and control of weeds to stripping and picking, storage and ginning.

About 3000 spindle-type cotton pickers now are in use, compared with several hundred shortly after World War II, and their advantageous operation is under intensive study. The campaign, which has active co-operation of farm machinery, cotton gin and other manufacturers, calls also for complete mechanization of crops normally planted in rotation with cotton.

Labor Lament: 81st Congress

LABOR has a long list of congressional incumbents it will try to unseat next year.

Why? From labor's point of view, the record of the 81st Congress to date is not much better than that of the 80th Congress. The only favor they have received from this Congress is the increase in the minimum wage from 40 to 75 cents an hour.

Biggest blow to labor, of course, was the refusal of this Congress to repeal the hated Taft-Hartley Act. Since then labor has received one blow after another. Latest is the elimination from the Military Appropriations bill of the time-study ban. This was to have extended the ban from the Navy to the Army and Air Force. Now the Navy, for the first time in many years, is in a position to use stop watches and conduct time studies in its shore establishments.

Another blow was the Senate refusal to confirm reappointment of Leland Olds as a member of the Federal Power Commission. Still another was failure of both houses to act on the eagerly sought federal-aid-to-labor-education program. Both houses failed to authorize grants to the states to foster safe working conditions.

Streamlining of Withholding Tax System

PLANS for streamlining and improving collection of income tax withheld from wages of employees and taxes due under the Federal Insurance Contributions Act are underway.

Final regulations will not be issued until late this month so interested persons may have a chance to make comments or suggestions. The revised procedure is expected to take effect Jan. 1, 1950, says George J. Schoeneman, commissioner of internal revenue. He says the plan is expected to effect savings to employers generally. Proposed changes are expected to save the Treasury Department well over $1 million in interest costs and substantial additional clerical costs in handling documents.

Here's how the plan is to work:

1. Combined Return Form—A new combined form (941) will be used in place of Form W-1 used for reporting income taxes withheld from wages and Form SS-1a used for reporting taxes due under the FICA. The combined form will cut in half the number of returns filled by employers and handled by collectors' offices. It permits employers to pay both taxes with one check, if desired.

2. Deposit of FICA Taxes—Employers using the system of making monthly deposits of income tax withheld from wages, then using the depository receipts instead of cash in making payments on quarterly returns, may use the same system for employer and employee taxes due under FICA.

3. Federal Reserve Depositaries—Deposits will be made in the 12 Federal Reserve Banks, but employers may give their tax deposits to authorized commercial banks for forwarding if they want to.

4. New Depositary Form—To insure accuracy and simplicity in crediting employers with tax deposits, a new blank, Form 450, will be given to employers making deposits. These forms will be okayed by Federal Reserve Banks when they receive the deposits. Validated receipts will be sent to employers for attachment to their quarterly returns on Form 941.

Employers who are liable for more than $100 of income tax withheld from wages and FICA taxes per month will be required to deposit these taxes by the 15th day of the next month after the first and second month of each quarter of the calendar year. Here's an example: You should deposit your January tax by Feb. 15, your February tax by Mar. 15.

You may deposit tax for the third month in the quarter any time in the next month. This means you may deposit March tax any time in April. You should remember though that the deposits should be made early enough so a validated receipt will be available for filing with the quarterly return.

Reciprocal Trade Agreements

RECIPROCAL trade agreements program will continue to be administered much as before under the new Trade Agreements Extension Act with one exception: A tariff commission member or alternate will serve as chairman of the Committee on Reciprocity Information.

This is a group of special interest to business and industry: Its function is to receive, digest, and circulate to the entire trade-agreements organization the views of interested persons regarding any phase of proposed or existing trade agreements.

The entire program will be administered by the Interdepartmental Committee on Trade Agreements, chairmaned by a State Department representative. Trade agreements will continue to be negotiated by the Trade Agreements Committee.

A new executive order by the President says each future agreement, in conformity with past practice, will contain a most-favored-nation commitment.

U. S. Strikes May Aid Western Europe

German and Belgian steel producers are operating below capacity, could supply American consumers. British and French output could be diverted for coveted dollars

AMERICA'S labor difficulties may prove a temporary boon to Western Europe.

German and Belgian steel producers believe there is a good chance to sell to the U. S. if the steel strike lasts much longer. Production in both these countries is slipping because of falling demand. Domestic and foreign consumers are still keeping British and French output high, but some tonnage could be diverted to the U. S. for coveted dollars.

When or if the steel strike has widespread effects on American consuming industries—notably automotive—Europeans think there may be more call for their products. This thinking nourished optimism at the French auto show which opened this month in Paris.

Ruhr Steel Output Drops

Steel ingot production in Western Germany declined sharply from 917,817 net tons in August to 835,791 tons last month. Daily output declined 5.4 per cent. New orders have been fewer; for the past few months Ruhr industry has been producing for stockpile. Now steelmen are turning out 30 to 40 per cent more than they can sell—hence, the interest in American markets.

Heaviest order declines are in railway materials, structurals and forgings. Further reductions are imminent and workers are being furloughed. The general credit pinch is considered responsible for this state. Domestic steel consumers haven't the money to finance purchases. In other markets foreign competitors have the advantage because the Ruhr's steel plant is now outmoded.

Reflecting the crisis in steel is the depression in scrap markets. Monthly scrap collections amount to 500,000 tons, but steel plants use only 250,000. A price reduction—quotations are government-controlled—in scrap of $2.38 per ton is being resisted. The trade in Western Germany suffers from overexpansion, the only industry in the entire economy which has such a malady. Many scrap dealers are in favor of a cartel.

So changed are economic conditions from just a year ago that all steel allocations can be lifted Jan. 1. A completely free market will also be restored to the coal industry.

Ruhr export coal prices remain the same, at 52 marks per ton, in spite of devaluation of the mark. This is in accordance with demands from France which relies on German coal and had agreed to devaluation only if coal prices remained the same in marks. This means a reduction of the dollar price of exported coal from $16 to $12.50 per ton, at least for German shipments to France. The domestic coal price in marks remains the same at 42, or about $10 per ton.

U. K. Production Up

Production of steel in Great Britain edges upward. Some tonnage could be diverted to American consumers.

Output of steel ingots and steel for castings in September was at an annual rate of 17,815,000 tons, compared with a rate of 16,747,000 tons in August and 17,287,000 tons in September, 1948. Pig iron production was at an annual rate of 10,790,000 tons, compared with a rate of 10,602,000 tons in August and 10,536,000 in September, 1948.

French Automakers Eye U. S.

Renault and other French automakers plan to strengthen their position in the American auto market just in case the steel strike cripples Detroit.

This was evidenced at the 36th Paris auto show which opened early this month. More than 1200 manufacturers are taking part, compared with 1000 last year. Attracting much attention at the exposition is a small Renault designed to sell cheaply in the U. S. Another midget is the 2 hp Citroen selling for $650. It can attain a speed of 50 miles per hour and can travel 60 miles on a gallon of gasoline. French producers also display deluxe vehicles, notably Satutchick & Co.'s Delahay selling for $14,300.

Forty-one French exhibitors are showing 18 auto models and 96 types of trucks. In 1938, 66 auto models and 96 truck types were on display. The U. S. has the largest number of foreign models; 18 are shown by General Motors, Chrysler, Ford, Packard, Hudson, Willys-Overland, Studebaker, Nash and Kaiser-Frazer. Other foreign exhibits come from nine British firms, three Italian, three Czechoslovak and one German.

France holds third place in world production of commercial vehicles and fourth in output of autos, Russia not included. It makes one vehicle to every two of Great Britain and 21 of the U. S. Canada is just ahead of France in auto manufacture.

French auto production is now 22 per cent above that of 1938 and 5 per cent ahead of the record 1929. Output is approaching 300,000 units a year, but the Monnet plan estimates that 400,000 can be turned out in 1950 and 500,000 in 1951 and 1952. More than 90 per cent of the production is done by five firms; the other 28 make less than 25,000 autos a year.

Renault produced 65,800 in 1948, Citroen 42,800; Pugeot 33,600; Sinca 18,200 and Matford 14,900. Auto exports are mounting—54,800 went overseas during the first half of this year, compared with 73,200 for all of 1948.

ECA funds totaling $16,535,500 will be used by Electricite de France, the government-owned power company, to purchase miscellaneous equipment and spare parts in the U. S. for the interconnected French power system. ECA has also approved a project for construction of a thermal electric power plant of 100,000 kw capacity at Dechy, France. The plant will be operated by Charbonnages de France which controls the French coal industry. Cost of the project includes $15 million in ECA funds and the local currency of $4.5 million to be supplied by the French government.

Linz Steel Plant Remodeled

A steel plant which Adolph Hitler started at Linz, Austria, near his birthplace, to supply the armor plants of the Third Reich is being

Opportune Time?

ELEVEN British trade unionists are coming to America to see how U. S. unions operate. They seek knowledge on how trade unionists here are trained in techniques of management, wage systems and job evaluation.

They will visit many U. S. industrial centers and will discuss their problems with officials and technicians of the AFL, CIO and unaffiliated groups. During the six weeks the British representatives are here, they will also study the work of engineering and research departments of American unions which have been helpful in increasing industrial productivity. All eleven visitors were selected by the British Trades Union Council.

cut back to size and adapted with Marshall Plan aid to the uses of peace.

Hitler and Hermann Goering had planned to erect 12 blast furnaces with a capacity of more than 2 million tons of pig iron a year. Six furnaces were completed, but of these only three are necessary to serve Austria's domestic and export needs, in addition to other domestic steel facilities. Three other furnaces will be sold, one probably to Sweden. Besides the blast furnaces, the steel plant now has two 200-ton open hearths, a plate mill and a small sheet mill. ECA is helping to build a slabbing mill and a hot strip mill. A cold rolling mill may be added later.

When the Linz plant is in full production, it will turn out 500,000 tons of steel a year, accounting for two-thirds of Austria's steel production. The plant was designed before the war by H. A. Brassert & Co., New York.

JAMES W. ZUBER

RUSSELL C. JAENKE

Russell C. Jaenke, advertising manager of STEEL since 1941, has been appointed director of advertising of the Penton Publishing Co. James W. Zuber becomes business manager of STEEL.

Mr. Jaenke joined the company in 1926 as an advertising salesman on STEEL, serving successively as territory manager and as advertising manager. His new duties as director of advertising for the company will encompass advertising activities of all Penton publications. Mr. Jaenke was elected a vice president of Penton in 1944.

Mr. Zuber joined Penton in 1933 as a STEEL circulation salesman. He later became advertising representative on STEEL in the eastern territory, was made circulation manager in 1938 and since 1945 has been director of circulation and research for Penton.

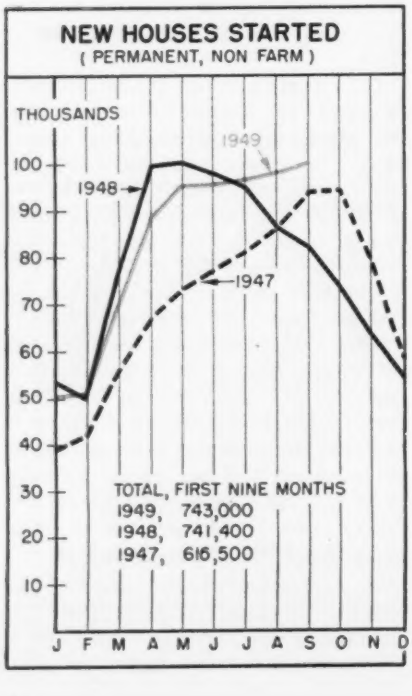
Robert L. Hartford has been made business manager of *Machine Design*. He joined STEEL'S editorial staff in 1936, later becoming Pittsburgh editor and Penton manager of market research.

Business Builder

Record number of new houses put under construction swells demand for metal products

DEMAND for products of the metalworking industry was swelled by the setting of a September record for number of new nonfarm houses started.

That month construction began on 100,000 new nonfarm units, the U. S. Bureau of Labor Statistics reports. It marked the first time that as many as 100,000 of such dwelling units were put under construction in September. By jumping from 98,000 in August the number for September constituted a marked contraseasonal move.



Construction of nonfarm dwellings has continued steadily upward, as shown in the accompanying chart, since the beginning of the year, with July, August and September at record levels. The Bureau's preliminary estimates show a 743,000-unit total for the first three quarters of 1949, surpassing last year's total for the first three quarters by 1600 units. Starts of nonfarm dwellings in September, 1948, were 82,200; in September, 1947, 93,800. The September, 1949 figure approximates that of May 1948, when the total was 100,300.

Feeling Steel Strike—Housing construction is beginning to be handicapped by the steelworkers' strike. Already the supply of some steel products, such as steel pipe, going into housing is exhausted in certain areas.

The September, 1949, starts require about 350,000 tons of products of the metalworking industry. Each six-room house takes about 3.5 tons of such products, the American Iron & Steel Institute says. The 1949 rate of usage of steel products in houses is equivalent to around 5.5 per cent of finished steel production. In 1938 the consumption of steel products in housing was less than half what it is now.

Major Uses — Today's six-room house may take as much as 1800 pounds of steel lath. Another large item is steel pipe for gas, water and heating purposes, totaling about 1200 pounds. Radiant heating, if included, would add about 1.5 tons to that total of pipe.

Nails and miscellaneous wire account for about 600 pounds; gutters and downspouts take approximately 475 pounds of steel; flashing and miscellaneous sheets used for protective purposes may take 200 pounds, while such steel hardware as locks, knobs and hinges can account for 90 pounds of steel.

Steel Windows Increasing—Other items include electrical steel conduit, 140 pounds; heating system, 300 to 800 pounds; bathroom, 300 pounds; kitchen equipment, 800 pounds. Steel windows are becoming popular in many small dwellings. They weigh about 50 pounds each, and a six-room house may have 16 of them.

Other metal products—from structural shapes to home appliances—go into new homes.

Pollution Control Grows

Water sanitation laws get more attention from federal, state and municipal governments

LOOK for increasing municipal, state and federal pressure to control water pollution. Gathering momentum of the trend toward abatement will affect metalworking because industrial use of river, harbor and lake waters is one of the three major causes of contamination. The others are public sewage disposal and soil erosion.

Federal Security Agency is earmarking $850,000 to states, territories and the District of Columbia to study water pollution resulting from industrial waste. A total of $2.2 million has been appropriated for the agency to initiate a nationwide program of water pollution control and prevention which Public Law No. 845, passed in June, 1948, contemplates.

Sanitation Laws Widespread — Now 41 states and the District of Columbia have laws against water pollution. Georgia, Idaho, Missouri, North Carolina, South Carolina, Utah and Wyoming have none. Laws go back as far as 1893, but many states —notably New York and California —have just enacted voluminous stream sanitation codes. Since the war, 27 states have enacted or amended such legislation. There are 11 formal interstate antipollution compacts and a few informal agreements.

The largest of the regional pacts is administered by the Ohio River Valley Water Sanitation Commission which seeks to control contamination in the 200,000-square mile Ohio river drainage basin. Participating are Ohio, Indiana, West Virginia, New York, Illinois, Kentucky, Pennsylvania and Virginia.

Costs to Industry Vary—In some cases the expense can not yet be computed. In some areas contamination is caused principally by soil erosion and public sewage. The cost of cleaning up the boundary waters between the United States and Canada from Port Huron, Mich., to Toledo, O., has been estimated. International Joint Commission believes a $98 million expenditure must be made by U. S. and Canadian municipalities and industries: U. S. cities, $68 million; Canadian cities, $14 million; U. S. industry, $13 million; Canadian industry $3 million.

Bethlehem Pacific To Build

BETHLEHEM Pacific Coast Steel Corp. will shortly begin building its new structural steel fabricating plant on property in Seattle acquired from Isaacson Iron Works.

A structural shop 140 x 400 ft will be erected. It will be equipped with forming, punching and shearing facilities for fabrication of a wide range of steel frame structures. Shop layout will be designed to permit a straight-line flow from receiving to shipping. Plant facilities will include a new transmission tower fabricating shop 80 x 400 ft and a complete galvanizing plant 60 x 150 ft.

Coincidentally, Bethlehem Pacific is constructing new tower testing frames at its plant in South San Francisco—the only facility of its kind on the West Coast. Frames will have a capacity for testing transmission towers up to a height of 150 ft. This height provides for the largest voltage transmission towers now in use.

Taconite Production Cost

CAPITAL investment for a taconite beneficiation plant capable of producing 100 million tons of pelletized ore annually would be $1.5 billion, not $150 million as reported in STEEL (July 4, 1949, p. 39). The $1.5 billion figure is based on current estimates of cost in relation to capacity: $15 per annual ton of production.

Sheet Metal Group Elects

PRESIDENT of the National Association of Sheet Metal Distributors for the coming year is Ray P. Farrington, Potts-Farrington Co., Philadelphia. He succeeds John P. Speck, Tiffin Art Metal Co., Tiffin, O., as head of the association.

Alexander Thomson, Tanner & Co., Indianapolis, and William H. Bowe, Herrick Co., Boston, are vice presidents of the association. Thomas A. Fernley Jr. and Robert C. Fernley, both of Philadelphia, will continue to serve as executive secretary and secretary, respectively.

Foundry Association Meets

NATIONAL Foundry Association will hold its 51st annual meeting at the Waldorf-Astoria in New York Nov. 10 and 11.

Among the speakers will be Dr. Leo Wolman, director, National Bureau of Economic Research, who will speak on government, labor and industry; Representative Harold H. Velde, Illinois, who will discuss the methods to stop the trend toward statism; and Stevens H. Hammond, president of Whiting Corp., whose subject is "Our Best Foot Forward."

CALENDAR OF MEETINGS

Oct. 24-25, National Association of Suggestion Systems: National fall conference, Hotel Statler, Cleveland. Headquarters are at 122 S. Michigan Ave., Chicago 3.

Oct. 24-28, National Safety Council: National safety congress and exposition, Stevens, Congress and Morrison Hotels, Chicago. Council headquarters are at 20 N. Wacker Dr., Chicago.

Oct. 26, American Iron & Steel Institute: Fourth regional technical meeting, Hotel Thomas Jefferson, Birmingham.

Oct. 26-27, National Conference on Industrial Hydraulics: Sheraton Hotel, Chicago. For details, write Otto J. Maha, Hannifin Corp., Chicago.

Oct. 26-28, National Metal Trades Association: 1949 convention, Palmer House, Chicago. Heaquarters are at 122 S. Michigan Ave., Chicago 3.

Oct. 27-28, Porcelain Enamel Institute: 18th annual meeting, French Lick Springs Hotel, French Lick, Ind. Headquarters are at 1010 Vermont Ave., Washington 5.

Oct. 27-28, Gray Iron Founders' Society Inc.: 21st annual meeting, Edgewater Beach Hotel, Chicago. Society headquarters are at 210 National City-East 6th Bldg., Cleveland.

Oct. 28, American Institute of Mining & Metallurgical Engineers: Annual fall meeting, Pittsburgh section of Open Hearth Committee, Iron & Steel Division and Pittsburgh Section, AIME, William Penn Hotel, Pittsburgh. Institute headquarters are at 29 W. 39th St., New York.

Oct. 28, Illinois Mining Institute: 57th annual meeting, Hotel Abraham Lincoln, Springfield, Ill. Institute heaquarters are at 28 E. Jackson Blvd., Chicago.

Oct. 30-Nov. 2, National Tool & Die Manufacturers Association: Annual meeting, Hotel Statler, New York. Association heaquarters are at 1412 Union Commerce Bldg., Cleveland.

Oct. 31—Nov. 1, American Machine Tool Distributors' Association: 25th anniversary meeting and banquet, Hotel Gibson, Cincinnati. Office of the secretary is at 505 Arch St., Philadelphia 6.

Nov. 1-5, Pacific Chemical Exposition and Pacific Industrial Conferences: Running concurrently at San Francisco Civic Auditorium.

Nov. 2, American Iron & Steel Institute: Fifth regional technical meeting at the Waldorf-Astoria, New York.

Nov. 2-4, American Society of Civil Engineers: Fall meeting, Washington. Society headquarters are at 33 W. 39th St., New York.

Nov. 3, Society of Advancement of Management: Annual banquet, Hotel Statler, New York. Society headquarters are at 84 William St., New York.

Nov. 2-4, Industrial Management Society: 13th annual time and motion study clinic, Sheraton Hotel, Chicago. Society public relations headquarters are at 176 W. Adams St., Chicago.

Nov. 2-4, American Society of Civil Engineers: Fall meeting, Washington.

Nov. 2-4, American Society of Body Engineers: Fourth annual technical convention, Rockham Memorial Building, Detroit.

Nov. 2-4, Triple Mill Supply: Meeting of presidents, secretaries, convention and executive committees of American, Southern and National associations, at the Homestead, Hot Springs, Va. Headquarters of American Supply & Machinery Manufacturers' Association are at 1108 Clark Bldg., Pittsburgh.

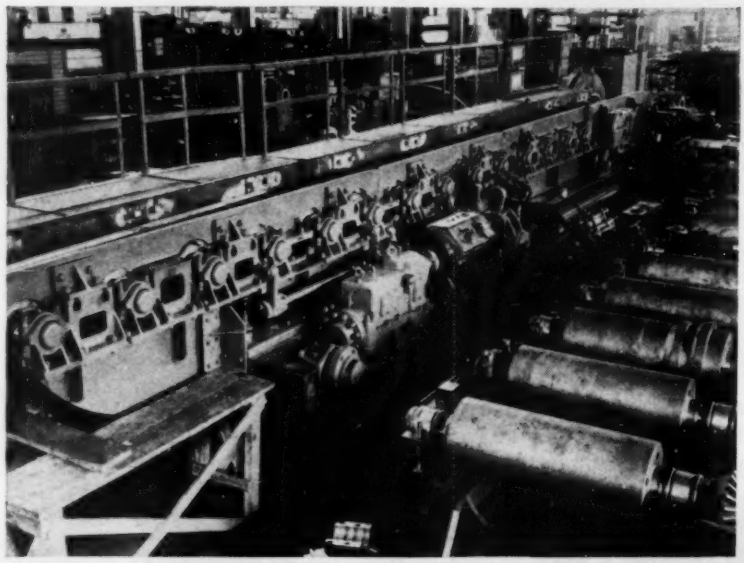
Nov. 3-4, Metals Casting Conference: Sponsored by Purdue University, Lafayette, Ind.

Nov. 10, American Iron & Steel Institute: Sixth regional technical meeting, at the Mark Hopkins Hotel, San Francisco.

Nov. 10, Purchasing Agents Association of Chicago: Meeting, Hotel Sherman, Chicago. Association headquarters are at 134 N. LaSalle St., Chicago.

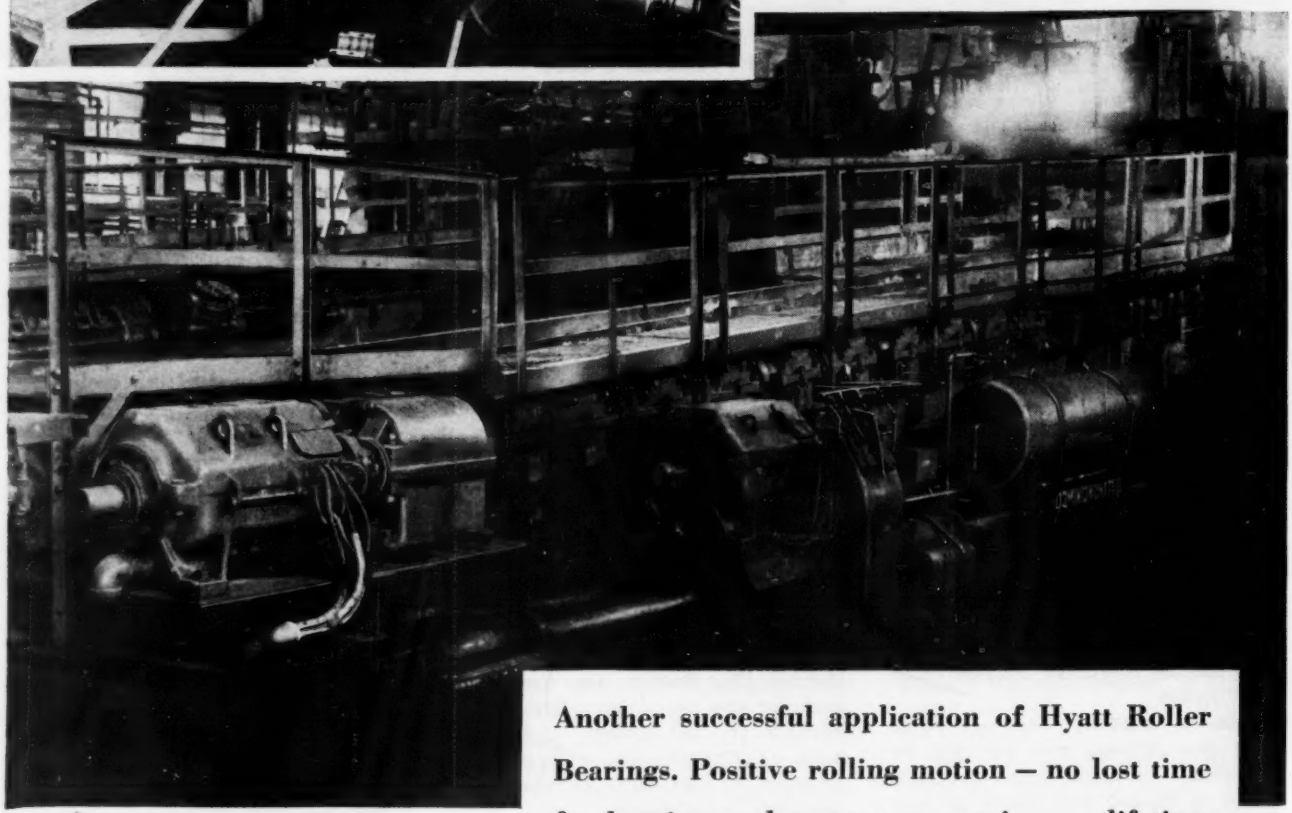
Nov. 10-11, American Management Association: Meeting on industrial cost reduction, at Palmer House, Chicago. Association headquarters are at 330 W. 42nd St., New York.

Dominion Engineering Built for Algoma Steel

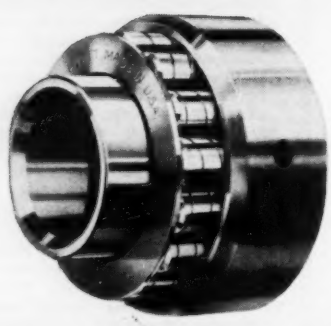


Hyatt Roller Bearings are used on both table roll journals and the lineshaft of the Traveling Tilt Tables at Algoma Steel in Sault Ste. Marie, Ontario.

Left: Under construction at Dominion Engineering Works, Lachine, Quebec, and now in use at Algoma Steel rail and structural mill as shown below.



Another successful application of Hyatt Roller Bearings. Positive rolling motion — no lost time for bearing replacement or repair . . . a lifetime of performance.



In cranes, cars, motors, and other auxiliary equipment, too, Hyatt Roller Bearings are serving equally as well. Hyatt Bearings Division, General Motors Corporation, Harrison, N. J.

HYATT ROLLER BEARINGS

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Steel supplies of automakers begin to dwindle. Two more weeks of production is all the most optimistic predict. Wide cold-rolled sheets to be bottleneck

DETROIT

ABOUT two more weeks is all the most optimistic give the automotive industry, as steel stocks dwindle to the vanishing point. While supplies of some types of flat-rolled material are adequate for a much longer period, there are the usual bottlenecks in which purchasing departments are squirming furiously. Wide cold-rolled sheets for roofs, hoods and fenders probably are the most critical, although the average auto company executive maintains stoutly the principal danger to continuing assemblies lies with suppliers. Position of the latter varies widely, some maintaining they can outlast the steel stocks of the auto plants, others just whistling in the dark and keeping their fingers crossed.

There has been a rush to warehouses in the effort to balance out steel stocks and one interest here, specializing in flat-rolled steel, has said its supplies were scheduled to be exhausted by last Wednesday, after trying to satisfy a swarm of new buyers in the last few weeks.

This Is Showdown—The feeling is growing that "this is it," the ultimate showdown with monopoly unionism which had to come sooner or later, and a certain sense of relief is evident in Detroit's thinking. The fantastic degree to which union leaders have gone to support demands going beyond all reasonable limits is just not going to stick this time, and you get the occasional expression from people you talk to: "We hope to God Big Steel does not weaken."

One of the more ludicrous aspects of the steel strike is right here in Detroit at Great Lakes Steel Corp. The company's nine-year pension plan, of the contributory type, provides benefits far surpassing the minimum recommendations of the fact-finding committee, and Great Lakes has been repeating all the details in full-page advertisements in the three Detroit papers, messages which have been appearing for approximately ten days in a row.

Redoubles Picketing—The only result has been that the USA-CIO local at the plant redoubled its picketing efforts, even sending boats out into the Detroit river on "water picketing" patrol, which of course promptly made the headlines.

The company was forced to close down coke ovens due to the failure of transportation employees to report to work, and this drew further recriminations from the union. A crew of supervisory maintenance employees stationed in the plant to keep the heat on open-hearth furnaces was virtually barricaded by union pickets and it was questionable how long plant food supplies would last.

May Use Planes—Sustenance probably can be flown in if eventually necessary, but it would not be surprising to see the union mount an "air picket" line in such a case—perhaps even leading to dog-fights in the sky between pickets and those trying to supply the plant maintenance gang. Most of the Great Lakes office personnel have been closed out of their jobs by pickets, although some clerks have been admitted.

When one union international official was questioned about the trouble, he said it resulted from "untrue" statements which the company had been publishing in its newspaper advertisements. Asked further about just what was untrue in these presentations, this USA officer replied that he was not familiar with the facts of the situation at all, he was just directing the strike activity. You can put that statement right across the board for the majority of steelworker union leaders throughout the country.

New Model Planning Upset—Upshot of the whole materials mess has been to throw new model planning of the major sections of the industry into utter confusion. Plans for November unveilings now have gone into the "maybe" stage since there is little use in bringing out something new if the wherewithal to build it is not there.

Thus last week Hudson held an off-the-record preview of its smaller and lower-priced model scheduled to appear around Nov. 20 officially and while company officials tried to drum up enthusiasm over its possibilities, you could tell their heart was not in it, because they were not even sure they could have all their dealers sampled by the scheduled introduction time.

It is no secret that Hudson has built several hundred of the new Pacemakers and has shipped them out to dealers who promptly stack them away in the back room under canvas. Price, performance and engineering details will have to wait, but do not expect any sensations.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1949	1948
January	445,092	422,236
February	443,734	399,471
March	543,711	519,154
April	569,728	462,323
May	508,101	359,996
June	623,689	454,401
Six mos.	3,134,055	2,617,581
July	604,351	489,736
August	678,092	478,186
September	647,000*	437,181
October		516,814
November		495,488
December		514,337
12 mos.		5,549,323

* Preliminary.

Estimate for week ended:

	1949	(Same week) 1948
Oct. 1	151,593	121,475
Oct. 8	148,443	119,398
Oct. 15	147,323	123,185
Oct. 22	142,000	123,067

Estimates by Ward's Automotive Reports

Production Pace Slows

SLOWING of the current production pace throughout the industry can be attributed either to the steel strike or to field stocks which have grown a little beyond what might be considered normal. Official pronouncements lay the blame on the steel situation, the boys in the backroom hint otherwise. There are an estimated 700,000 new cars now in the hands of dealers and in transit, so even if the entire industry closed down for a month, the public would be able to buy all the cars it wanted. Nevertheless, the situation is made to order for dealers who are beginning to wonder whether they might not be wise to tighten up a little on trade-in allowances after the relaxation of the past few months.

One prominent auto executive assesses the retail market as perfectly sound. He says the picture to-

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day is just a matter of the public becoming overly cautious in its buying habits, although still loaded with the cash to make purchases. On the theme that "action is always followed by reaction," he likens the condition today as the aftermath of the hectic buying surge of the immediate postwar years.

Assemblies Cut—Figure it out for what it is worth: Packard has cut its assembly schedules in half. Kaiser-Frazer is shutting down for an indefinite period — no explanation offered. Willys-Overland is down again for a week—balancing inventories. General Motors has stopped all overtime operations. General Motors Truck Division has cut back schedules by 20 per cent. Mercury has trimmed output by 10 per cent. Ford is easing up. Hudson was down for a week, is now resuming at a slower pace. Nash is slowing its schedules. Studebaker has cut off Saturday operations, in force during September. Cadillac has gone back to an 8-hour day. Nothing drastic, of course, but it tabs the tempo of the times. From here on out, it's anybody's guess.

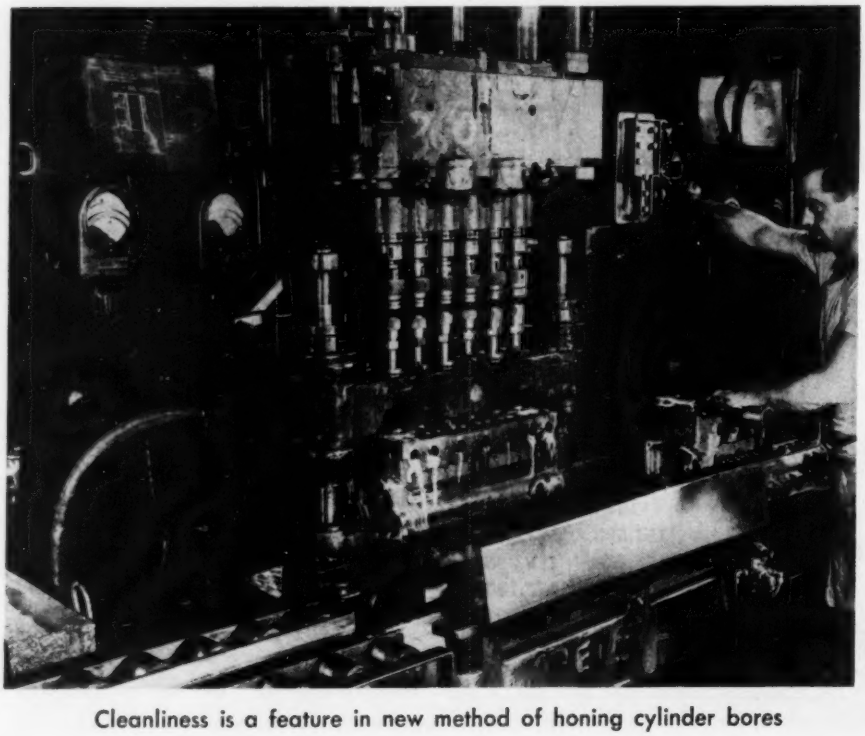
New Honing Method Developed

LONG experimentation at Studebaker has developed a method for honing cylinder bores within 0.0003-0.0004 inch out-of-round on a production basis with no rejection of cylinder blocks traceable to eccentricity or taper.

In years past the bores had been honed according to the generally accepted method of using oil as a coolant, but the result was too many blocks which had to be scrapped or rehoned. The trouble seemed to center in the fact that bores were o.k. when hot immediately after honing, but were screwy when they reached inspection.

According to Studebaker, the problem was battled for some 13 years, and appears to have been licked by the substitution of a water-soluble coolant, a product of the S. H. Mack & Co. Inc., and used in proportions of 20 to 1. Representatives of several abrasive manufacturing companies developed specifications for honing sticks which had to be changed in the switch from oil to water-base coolant. Water-soluble material also is used for seating and tapping the block so that it will be clean when it reaches the honing station.

Shows Little Wear — Since the bores come out of the honing machine cool, what happens when they become hot under operative conditions? Says Studebaker: An engine was run for 50 hours at 4500 rpm under full load, the equivalent of 4250 miles at 85 mph. Torn down for examination, the unit showed an insignificant amount of wear and a truer contact between piston rings and cylinder wall than under the old finishing system. Honing lines still were visible on the bores. Not only that, but the new honing job is cleaner, degree of roundness and straightness is a little less than perfect, production cost has been cut, and honing time reduced from 16 to 7½ seconds.



Cleanliness is a feature in new method of honing cylinder bores

More Die Castings Used

BY THE WAY, C. R. Maxon of the New Jersey Zinc Co. supplies the information that the new Studebaker models carry 11 more pounds of zinc die castings than previous jobs. The grille, formerly a steel stamping, now comprises two die castings, each weighing 3 pounds. The airplane-type front end spinner is a new die casting weighing 5 pounds. In addition, the front fender "eyebrows" are somewhat heavier, as well as the rear tail light housings. Headlamp bezels are now die cast, adding further to the zinc poundage. This seems to confirm a trend developing in the auto industry toward substitution of die castings for rolled steel sections of a decorative nature. Oldsmobile, it will be recalled, has one of the longest die castings ever produced in its rear fender molding.

K-F Builds in West

ALTHOUGH production operations of Kaiser-Frazer have been suspended for the time being—not because of the steel strike or any impending model change—construction has started on a $350,000 assembly plant at Portland, Oreg. Scheduled for completion early in 1950, the plant will have capacity for 20 cars a day and will employ a modest 100. Component production parts, including primed bodies shipped 16 to a railroad car, will be received from the K-F plant at Willow Run, and will be assembled, painted and trimmed. Operating supplies, along with some production parts, will be purchased in the Oregon area.

The plant is of one-story design, 200 x 250 feet in size. Production operations, including body, chassis and final assembly lines will be concentrated in two 100-foot bays flanked by auxiliary office space, boiler room and locker rooms. Four spur lines serve the plant, with shipping and receiving operations centered at a covered railway dock which will run the entire length of the building.

Oil Reserves Adequate

AMONG other things, last week was oil progress week, and at a Dayton, O., dinner, C. F. Kettering, General Motors research consultant, hastened to assure his listeners that government and industry surveys prove petroleum reserves are more than adequate to the nation's present and future fuel needs.

Mr. Kettering noted that if petroleum reserves ever run low, the possibilities of shales, coals and natural gas will make up any deficiency.

When These 6,377 Fasteners Pay Off!

Dark sky . . . wind . . . devastating rain mean there's no time to lose. So you give 'er everything she's got and pray you'll get in most of the crop before it's too late. That's when the holding power of the 6,377 fasteners in this combine really pay off.

1867 bolts . . . 415 cap, set and tapping screws . . . 1840 rivets . . . 2255 nuts form the steel network that locks the framing members of this combine together.

Because these fasteners are called upon to hold their own on a rugged day-in and day-out schedule, top quality is essential. That's why Russell, Burdsall and Ward with 104 years' experience still carries on intensive research and development work to improve fastener holding power further.

It is unsound economy to use inferior fasteners, since the price of fasteners is such a small part of the total product cost. It isn't the initial price but the cost of *using* fasteners that counts.

To attain *T*rue *F*astener *E*conomy, you can save assembly time, reduce plant inspection, and get the maximum holding power per dollar of fastener cost with a dependable quality fastener. *T*rue *F*astener *E*conomy contributes to the kind of production savings that put more and more combines on U. S. wheatfields every year. It is this type of contribution to major American industries that explains why—for over 104 years—RB&W has been *making strong the things that make America strong.*

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

RB&W

Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Cal. Additional sales offices at: Philadelphia, Detroit, Chicago, Chattanooga, Oakland, Portland, Seattle. Distributors from coast to coast.

6,377 Fasteners are used in 1 American Combine

104 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

More Industry Alignments: Three Firms Sold

Three more industry alignments were brought about through the sale of three firms to new or established interests. A fourth company bought a factory site for a new plant.

Bowser Inc. Sells Unit

R. H. Damon, chairman of Bowser Inc., announced sale of all physical assets and property of Fostoria Screw Co. and all real property and machinery of Bowser Inc., Fostoria, Ind., to the Rose-Mankowitiz group of Cincinnati.

Fostoria Screw is a subsidiary of Bowser Inc. Sale price was not disclosed. The purchaser has formed a new corporation, Fostoria Screw Co. Inc., which will continue former business of Fostoria Screw with the same personnel.

In Illinois a packaging and materials handling firm bought a bakery equipment manufacturer.

AMF Buys Union Machinery

Union Machinery Co., Joliet, Ill., was bought by American Machine & Foundry Co., New York. Union makes bakery equipment: Bread dough dividers, rounder proofers, hoppers, dough chutes, and an automatic roll divider and rounder. American Machine & Foundry, manufacturer of automatic machinery since 1900, makes cigaret making and packaging equipment, stitching machinery and materials handling devices.

A Chicago tool company also was sold and will be transferred to Syracuse, N. Y.

Chicago Tool Company Sold

Manufacturing facilities of Sterling Electric Tool Products Co., Chicago, which were sold to Porter-Cable Machine Co., Syracuse, N. Y., will be moved to Syracuse for production of Sterling portable electric and pneumatic sanders. DeAlton J. Ridings is president of Porter-Cable.

Acquisition of Sterling is the second within a year. Last fall Porter-Cable bought Unit Electric Tool Co.

Purchase of a site for a new factory will give American Can Co. a third operating unit in Baltimore.

American Can Buys Site

Purchase of a 43-acre tract on the southwest limits of Baltimore from the Baltimore & Ohio Railroad for a milk container factory was made by American Can Co., New York.

C. H. Black, Canco president, says about 250 persons will be employed in the new plant, scheduled for completion within a year. It will have almost 150,000 sq ft of floor space at the start and provisions for future expansion. Demand for the milk containers, a prewar company development, has taxed existing production facilities and restricted supply of containers to large metropolitan areas. New plant will make larger supplies of paper milk containers available to dairy customers on the Atlantic seaboard and in the South.

New Meehanite Development

MEEHANITE Metal Corp., New Rochelle, N. Y., notified all foundries which produce Meehanite castings under contract with the company that it has established production techniques to enable the foundries to produce nodular graphite Meehanite metal on a commercial scale.

Meehanite metallurgists have developed a new process of making nodular castings with a special device and by means of treatment that assures accurate control of physical properties.

Crown Concentrates Facilities

MANUFACTURING facilities of Crown Can Co., subsidiary of Crown Cork & Seal Co., will be concentrated at its main plant in Philadelphia and its branches in Chicago and Orlando, Fla. Operations in the Baltimore area, now conducted in a portion of the company's main plant at Highlandtown, Md., will be transferred to the Philadelphia plant. Crown Cork & Seal, in need of additional facilities for its closure business, will take over the building used by the subsidiary.

Crown Cork, also finding it necessary to increase production of bottle caps in St. Louis, will remove its can manufacturing operations to the Crown plant in Chicago. Operations of Crown Can's Houston plant, which manufactures cans only, will be discontinued, it is understood.

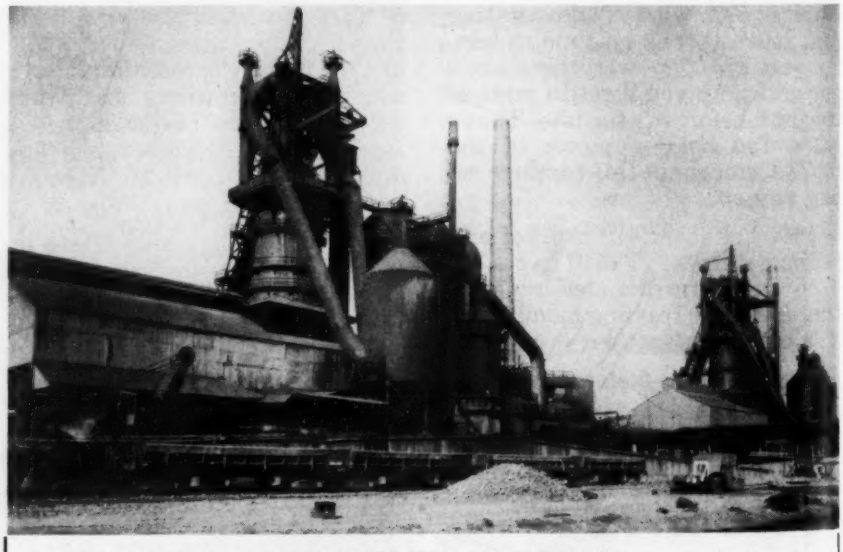
Guided Missiles Research

RESEARCH in specialized problems of guided missiles will be conducted by North American Aviation Inc. in a new laboratory under construction at its Downey, Calif., plant.

Estimated to cost $50,000 initially, it will be the first privately owned laboratory in southern California devoted exclusively to problems of extremely high altitude, "G" loads and vibration, extremes of temperature and humidity, and problems inherent in gyro-mechanisms.

Expansion Program Completed

COMPLETION of a program of plant expansion and equipment improvement, at a cost of $250,000, has increased capacity of the gray iron foundry operated by American Furnace & Foundry Co. and American Boiler & Foundry Co., Milan, Mich. The postwar program was stepped up when the companies became subsidiaries of Maumee Malleable Castings Co., Toledo, O. Six and a half acres of plant facilities are used for production of castings for the automotive, tractor, laundry equipment, heating, and machine tool industries.



WEST COAST PIG IRON CAPACITY DOUBLED: Kaiser Steel Corp.'s second blast furnace to be blown in gives the Fontana, Calif., plant a potential pig iron capacity of 2400 tons daily, double previous output. New furnace is to the right of original unit which produced continuously since 1943 except for one shutdown for relining

Briefs . . . .

Paragraphs on developments of interest and significance within the metalworking industry

Merritt Plywood Machinery Co. is the name under which the former Merritt-Monsanto Corp., Lockwood, N. Y., manufacturer of wood working machinery, will operate.

—o—

Troy Engine & Machine Co., Troy, N. Y., has bought the Brasington Corp., Cincinnati, manufacturer of rolling mills for grinding in the making of paint and ink. Brasington facilities will be moved to Troy.

—o—

Cincinnati Milling Machine Co. celebrated its 65th anniversary with an open house and inspection of all departments. Employees, their families and guests took part in the program which included a special celebration for employees with the company at least 25 years.

—o—

American Manganese Steel Division of American Brake Shoe Co., New York, appointed Whitehead Metal Products Co. Inc. as distributor of its complete line of Amsco welding products. Line consists of various types of rods and electrodes for hard facing and repair work and tungsten carbide rods. Whitehead has warehouses in New York, New Jersey, Pennsylvania, Massachusetts and Maryland.

—o—

Kilbourne & Jacobs Mfg. Co. is the name of the former Case Crane & Kilbourne Jacobs Co., manufacturer of cars, trucks and road machinery. Greater emphasis will be placed on the K & J line, but Case Crane products still will be produced.

—o—

Townsend Co., New Brighton, Pa., manufacturer of rivets, bolts, nails and special fasteners, established a new sales office in Philadelphia. Edward T. Brown heads the office which will cover most of the eastern seaboard.

—o—

Westinghouse Electric International Co., Pittsburgh, is carrying out projects involving: Lighting for a world's fair in Haiti, a baseball park in Puerto Rico and the main street in Venezuela's capital.

—o—

Industrial Product Sales Inc., Akron, is sales representative for Logan Machine & Metal Stamping Co., Akron, in the Ohio and Michigan area. Logan produces metal stampings and specializes in automotive and rubber company work.

—o—

Gil-Lair Products Inc., Pasadena, Calif., will manufacture under a series of exclusive patents, the All-Flex ball-bearing swivel pipe coupling which has a wide variety of industrial applications. Gil-Lair also manufactures flexible steel hose, mud guns and circulating heads.

—o—

Rucker Co., Los Angeles, a specialist in application of fluid power units and systems for industrial use, is now at 1855 Industrial St.

—o—

Carboloy Co. Inc., Detroit, appointed W. L. Reynolds Co., Baltimore, as an additional distributor in Baltimore for cutting tools, grinding wheels and abrasives.

—o—

Childers Mfg. Co., Houston, developed a new off-the-job, tailor-made roofing and siding fabricating service adapted for the type of industrial building usually sheathed with corrugated metal or asbestos.

—o—

B. C. Ames Co., Waltham, Mass., manufacturer of micrometer dial indicators and gages, appointed Hal W. Reynolds Co., Cleveland, exclusive sales representative in northern Ohio.

—o—

American Optical Co. is broadening and diversifying its manufacturing operations at its Buffalo plant which has been renamed the Instrument Division. Machinery is being transferred from the company's Southbridge, Mass., plant for production of additional items.

—o—

Solar Aircraft Co., San Diego, Calif., which got $2.1 million worth of orders for jet engine parts, will be able to maintain its present rate of production and employment. New orders were distributed between the company's Des Moines, Iowa, and San Diego plants.

—o—

Resistance Welding Institute, Cleveland, is offering a 32-page booklet explaining and illustrating advanced techniques in resistance welding processes. Write to the institute, Hartman Bldg., Detroit Ave. & Warren Rd., Cleveland 7. Publication covers theory and application of spot, seam, projection and butt welding.

—o—

Fairbanks, Morse & Co., Chicago, opened a diesel locomotive sales office for the Cleveland area. C. A. Mapp is district sales representative; H. D. Buckner is area service supervisor. They will be located in the company's Cleveland branch house, 2810 Superior Ave.

—o—

Ennis Supply Co., Minneapolis, purchased the entire inventory of Buday portable table saw from Nordberg Mfg. Co., Milwaukee. Ennis also received complete rights to manufacture the gas-powered saws used by lumber dealers, contractors, etc.

—o—

Gunnison Mfg. Co. and **Schilling Machine** shop, Baraboo, Wis., will manufacture new cultivators for Ford and Ferguson tractors under a partnership arrangement. C-H cultivators, as they are to be called, will be distributed through Goodman Equipment and Supply Co., Baraboo.

—o—

Jamestown Safety Guard Corp., a new firm in Jamestown, N. Y., is producing safety shields for various types of machinery. The safety device is an invention of George S. Anderson, vice president of the firm.

—o—

Parker Appliance Co., Cleveland, O., appointed Irving B. Moore Co., Boston, as distributor for Parker O-rings which seal hydraulic and other fluid handling systems.

—o—

Allis-Chalmers Mfg. Co., Milwaukee, started a program of giving 20 annual scholarships of $500 each for children of company employees.

—o—

American Home Laundry Manufacturers' Association, Chicago, reports factory sales of standard size household washers in August were greater than in any month since October, 1948. August total was 323,789 units, an increase of 61 per cent over 200,900 units sold in July. August sales of ironers were 32,300 units, compared to 17,700 in July, an increase of 82.5 per cent.

—o—

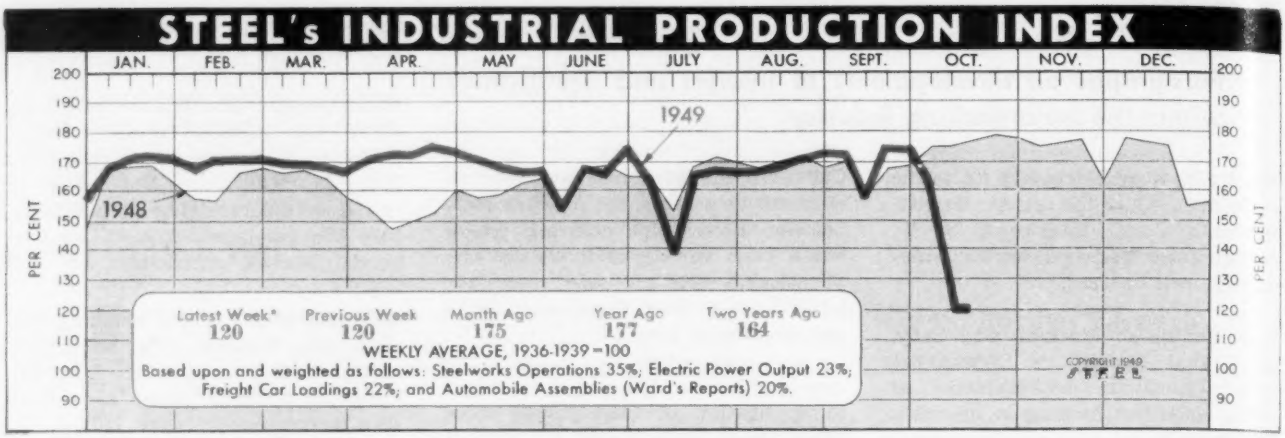
Cleveland Republic Tool Corp.'s assets were offered for public sale when a private offer of $75,000 was rejected in the hope a public auction would bring more.

—o—

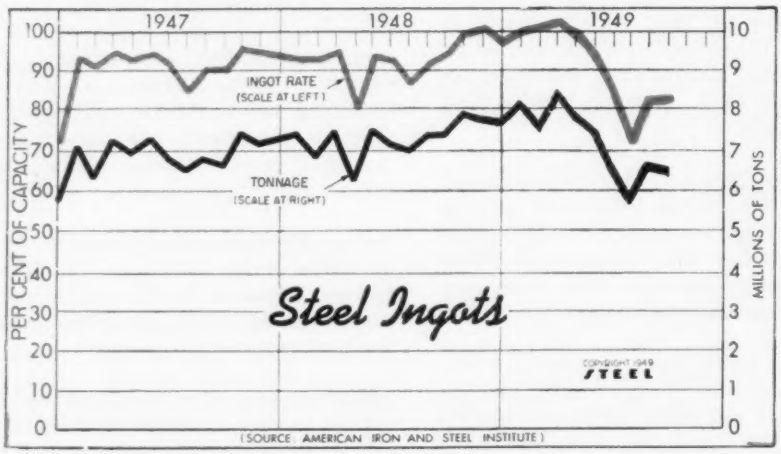
Osgood Co. and **General Excavator Co.,** Marion, O., appointed Equitable Equipment Co., New Orleans, as distributor of Osgood and General excavating and materials handling machinery in southern Louisiana and the southernmost counties of Mississippi.

—o—

Hanover Steel Corp., wholly owned subsidiary of Solar Steel Corp., Cleveland, will operate as the Hanover Division of Solar. The division is a steel warehouse and processor serving customers of flat-rolled steel products in the eastern area.

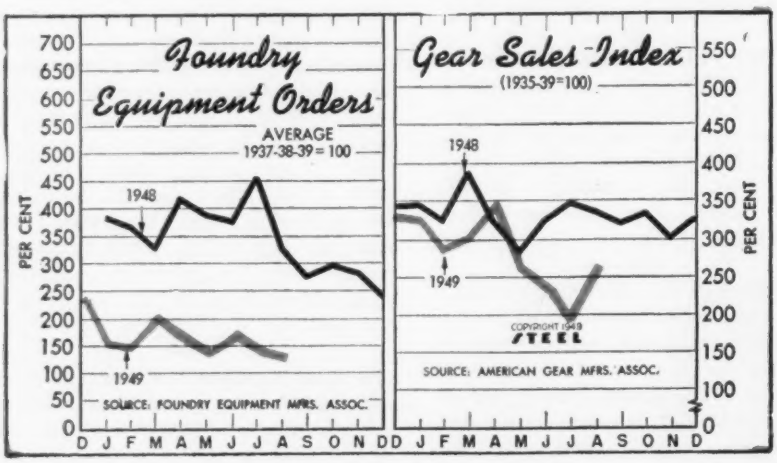

STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
PER CENT
1948
1949
Latest Week* 120
Previous Week 120
Month Ago 175
Year Ago 177
Two Years Ago 164
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
COPYRIGHT 1949 STEEL

* Week ended Oct. 15 (preliminary).



Steel Ingots

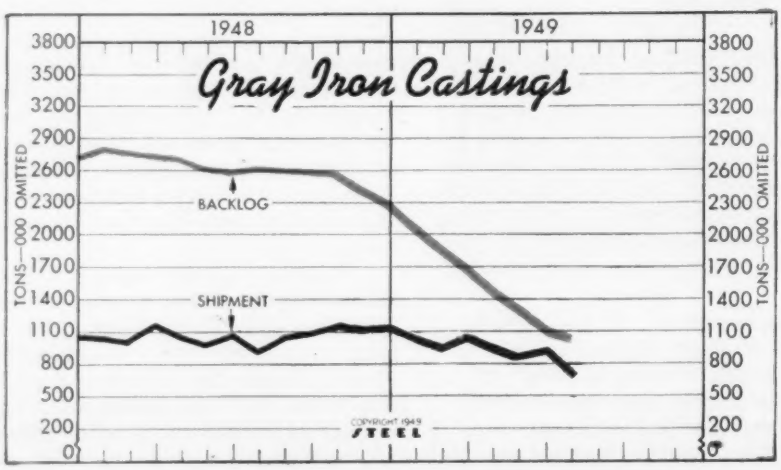
	Production (Net Tons—000)			Operating Rate (% of Capacity)		
	1949	1948	1947	1949	1948	1947
Jan.	8,183	7,473	7,213	100.2	93.6	93.2
Feb.	7,481	6,940	6,422	101.4	93.0	91.9
Mar.	8,388	7,608	7,307	102.7	95.3	94.4
Apr.	7,785	6,218	7,043	98.4	80.4	93.9
May	7,590	7,572	7,329	92.9	94.8	94.7
June	6,498	7,256	6,969	82.2	93.8	92.9
July	5,781	7,067	6,570	70.9	88.7	85.1
Aug.	6,715	7,438	6,982	82.2	93.1	90.2
Sept.	6,572	7,416	6,789	83.3	96.1	90.3
Oct.	....	7,987	7,560	....	100.0	97.7
Nov.	....	7,787	7,233	....	100.7	96.5
Dec.	....	7,771	7,366	....	97.5	95.4
Total	....	88,534	84,784	Ave.	94.0	93.0


Foundry Equipment Orders
AVERAGE 1937-38-39=100
1948
1949
PER CENT
SOURCE: FOUNDRY EQUIPMENT MFRS. ASSOC.
Gear Sales Index
(1935-39=100)
1948
1949
COPYRIGHT 1949 STEEL
SOURCE: AMERICAN GEAR MFRS. ASSOC.
D J F M A M J J A S O N D D J F M A M J J A S O N D

Foundry Equipment Orders* / Gears Sales

	Foundry Equipment Orders* —Index— (1937-38-39=100)		Gears Sales —Index— (1935-39=100)	
	1949	1948	1949	1948
Jan.	149.9	380.9	320.7	346.8
Feb.	144.4	367.3	282.3	324.4
Mar.	190.8	326.2	299.1	389.8
Apr.	172.0	412.0	339.0	320.9
May	121.9	388.5	250.1	283.6
June	164.9	376.8	227.8	324.1
July	146.6	456.3	193.1	348.4
Aug.	127.1	324.7	262.0	335.6
Sept.	....	273.5	....	320.4
Oct.	....	296.0	....	333.3
Nov.	....	284.4	....	309.0
Dec.	....	243.7	....	325.9

* By foundry trades only.



Gray Iron Castings

(U. S. Bureau of Census)

Tons—000 omitted

	Shipments		Backlogs*	
	1949	1948	1949	1948
Jan.	1,040	1,064	2,065	2,803
Feb.	987	1,024	1,857	2,769
Mar.	1,075	1,169	1,639	2,726
Apr.	929	1,051	1,446	2,691
May	867	993	1,243	2,602
June	906	1,072	1,087	2,587
July	697	914	1,032	2,601
Aug.	....	1,051	....	2,599
Sept.	....	1,088	....	2,587
Oct.	....	1,148	....	2,523
Nov.	....	1,100	....	2,407
Dec.	....	1,111	....	2,284
Total	....	12,786		

* Unfilled orders for sale to the trade.

The Business Trend

PARTIAL paralysis of the metalworking and metal-producing industries continued unchanged in the week ended Oct. 15. STEEL's industrial production index for the week remained at 120 per cent of the 1936-1939 average. Prospects for immediate improvement in the level of industrial production are not bright and the index probably will go lower. Even though the production index has skidded sharply it is being sustained to some extent by continued high production in the automobile industry. Shutdown of the automobile plants because of a lack of steel would result in another sharp decline in industrial production.

In the corresponding week a year ago the index was at 177 and heading toward the postwar high. Comparison of latest week figures with those for a year ago in the tables at the bottom of this page shows both the extent of the decline and the sustaining factors in maintaining the current level of the industrial production index.

AUTOMOBILES—Production of passenger cars and trucks in the week ended Oct. 15 totaled 147,323 units. Thus the automotive industry remained a bright spot in a rather gloomy production picture. Before the end of this month the industry's 1949 production will surpass that for all of 1929, up till now the best production year. Not all is serene in the industry, however. Plant shutdowns are imminent for some builders because of shortages of certain types of steel and even those with better stocks probably will be unable to produce much beyond Nov. 1.

CARLOADINGS—Freight carloadings were down to 574,228 cars in the week ended Oct. 8, lowest point since May, 1946. Strikes were also the reason for the earlier low figure.

COAL—Bituminous coal output rose slightly to 2.2 million net tons in the week ended Oct. 8 from 1.8 million tons in the preceding week. The increase resulted from the return to work of United Mine Workers miners west of the Mississippi, adding to output of nonunion mines and those employing Progressive Miners.

TRUCKLOADINGS—American Trucking Associations reports the volume of freight transported by motor carriers in August increased 17.8 per cent over July and 5.9 per cent over August, 1948. Carriers transported an aggregate of 3,497,043 tons in August, compared with 2,968,818 tons in July and 3,300,796 tons in August a year ago. Carriers of iron and steel hauled about 5 per cent of total tonnage.

CONSTRUCTION—September building and construction contracts awarded in the 37 states east of the Rocky mountains aggregated $1,093,724,000. This was the highest total since June, 1942, when wartime construction was at its peak. Last month's volume canceled the deficits of earlier months and brought the dollar volume for the first three-quarters to 1 per cent higher than for the same period in 1948. Investments by private owners accounted for almost 75 per cent of the September total.

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	8.0	7.5	86.5	98.0
	Electric Power Distributed (million kilowatt hours)	5,481	5,450	5,579	5,482
	Bituminous Coal Production (daily av.—1000 tons)	367	304	971	2,056
	Petroleum Production (daily av.—1000 bbl)	5,044	5,015	4,985	5,634
	Construction Volume (ENR—Unit $1,000,000)	$143.7	$152.4	$156.0	$170.2
	Automobile and Truck Output (Ward's—number units)	147,323	148,443	159,493	123,185
	*Dates on request. †1949 weekly capacity is 1,843,516 net tons. 1948 weekly capacity was 1,802,476 net tons.				
TRADE	Freight Carloadings (unit—1000 cars)	555†	574	743	914
	Business Failures (Dun & Bradstreet, number)	172	182	185	94
	Money in Circulation (in millions of dollars)‡	$27,546	$27,476	$27,454	$28,284
	Department Store Sales (changes from like wk. a yr. ago)‡	−12%	−8%	−4%	+10%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$10,477	$13,600	$12,830	$10,842
	Federal Gross Debt (billions)	$256.5	$256.6	$256.5	$252.4
	Bond Volume, NYSE (millions)	$14.1	$13.4	$14.3	$11.9
	Stocks Sales, NYSE (thousands of shares)	6,225	6,883	6,812	3,625
	Loans and Investments (billions)†	$66.1	$66.1	$65.7	$62.2
	United States Gov't. Obligations Held (millions)†	$37,252	$37,004	$37,378	$33,235
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	152.52	152.52	152.52	151.86
	STEEL's Nonferrous Metal Composite‡	170.6	172.2	180.3	221.1
	All Commodities†	152.1	152.3	154.6	165.0
	Metals and Metal Products†	169.2	169.2	169.5	172.1
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				

Men of Industry

PHILIP B. NILES

A. CHARLES AMANN

WARREN INGERSOLL

Philip B. Niles has been elected a vice president of **Yale & Towne Mfg. Co.,** New York, effective Nov. 7. He will devote his attention to marketing and to the development of executive personnel throughout the company. Mr. Niles has been public relations director for Owens-Illinois Glass Co., Toledo, O., since early in 1948, and had previously been vice president of the American Water Works Co. **A. Charles Amann** has been appointed industrial sales manager, Stamford Division. He joined Yale & Towne in July, 1949, and previously served four years with Illinois Lock Co., Chicago, as vice president and director of sales and advertising. **James F. Manning** has retired as superintendent of the Stamford Division's finishing department, and is succeeded by **John E. Charleson.**

—o—

H. R. Salisbury has been appointed president, **Air Reduction Sales Co.,** New York. He has been with the organization over 23 years in various executive capacities. Appointed vice presidents were **H. F. Henriques,** general sales; **J. J. Lincoln Jr.,** railroad sales and sales services; **S. B. Stouffer,** distribution; and **N. L. Wisser,** field office management.

—o—

Richard T. McCauley has been appointed assistant for the Portable Products Division, **Herman Nelson Corp.,** Moline, Ill., to be in charge of government relations. In this division Herman Nelson Corp. has, since 1941, manufactured portable heaters and ventilators used by the military during World War II, and now used in both military and commercial fields. Mr. McCauley was recently separated from the United States Air Force. He will maintain offices in Washington.

—o—

Frank J. Nugent has been appointed sales manager of heating equipment, Ingersoll Steel Division, **Borg-Warner Corp.,** Chicago. He will have headquarters at Kalamazoo, Mich. He was previously connected with Bryant Heater Co. as sales promotion and advertising manager, and as general sales manager with the Appliance Division, Rheem Mfg. Co.

—o—

Spencer R. Griffiths has been appointed assistant sales manager of **Unistrut Products Co.,** Chicago. He formerly was associated with Joseph T. Ryerson & Son Inc., in charge of stainless steel sales in the midwest.

—o—

Harry A. Erb has rejoined **Elliott Co.,** Jeannette, Pa., as assistant to **M. A. King,** vice president in charge of engineering, with headquarters at the main plant. He had served as blower engineer, manager of the service department and manager of the electric power department of Elliott's Ridgway Division. **C. H. Hosterman,** for many years manager, accessories department, has been appointed manager, general apparatus department.

—o—

D. C. Wheeler, recently elected a vice president, **Mack Trucks Inc.,** New York, will head a newly created southwestern division with headquarters at Dallas. Included in this realignment of Mack's sales territory are the company's already established Dallas, Houston, Oklahoma City, Okla., and New Orleans offices, most of Texas, and New Mexico, Oklahoma, Arkansas, Louisiana, Mississippi, and Mexico.

Warren Ingersoll has been appointed assistant to the president of **Lee Rubber & Tire Corp.,** Conshohocken, Pa. Until recently he has represented the Lee corporation interests on the West Coast with headquarters in San Francisco, and has been Philadelphia district manager of Lee's mechanical rubber division, the Republic Rubber Division, Youngstown.

—o—

Duncan C. McPhee has been appointed sales manager, **Borden Metal Products Co.,** and will be located at the main office in Elizabeth, N. J. He has been associated with the company for many years, and has been connected with the engineering department and also with the estimating department.

—o—

Westcott Chuck Co., Oneida, N. Y., announces appointment of **Herman H. Hobelmann,** 744 Harrison St., San Francisco, as its district representative in California, Oregon and Washington, and also the Reno district of Nevada.

—o—

Elwood E. Zerbe has been appointed field engineer in the Atlanta district for Nelson Stud Welding Division, **Morton Gregory Corp.,** Lorain, O. He joined the Nelson organization as a specialist on railroad applications last spring after four years with Franklin Railway Supply Co. in New York.

—o—

George L. Wheeler, formerly assistant purchasing agent of Wyeth Co., St. Joseph, Mo., has been appointed a sales representative of **White Metal Mfg. Co.,** Hoboken, N. J. He will cover Pennsylvania, Delaware, Maryland, Virginia, South Carolina, North

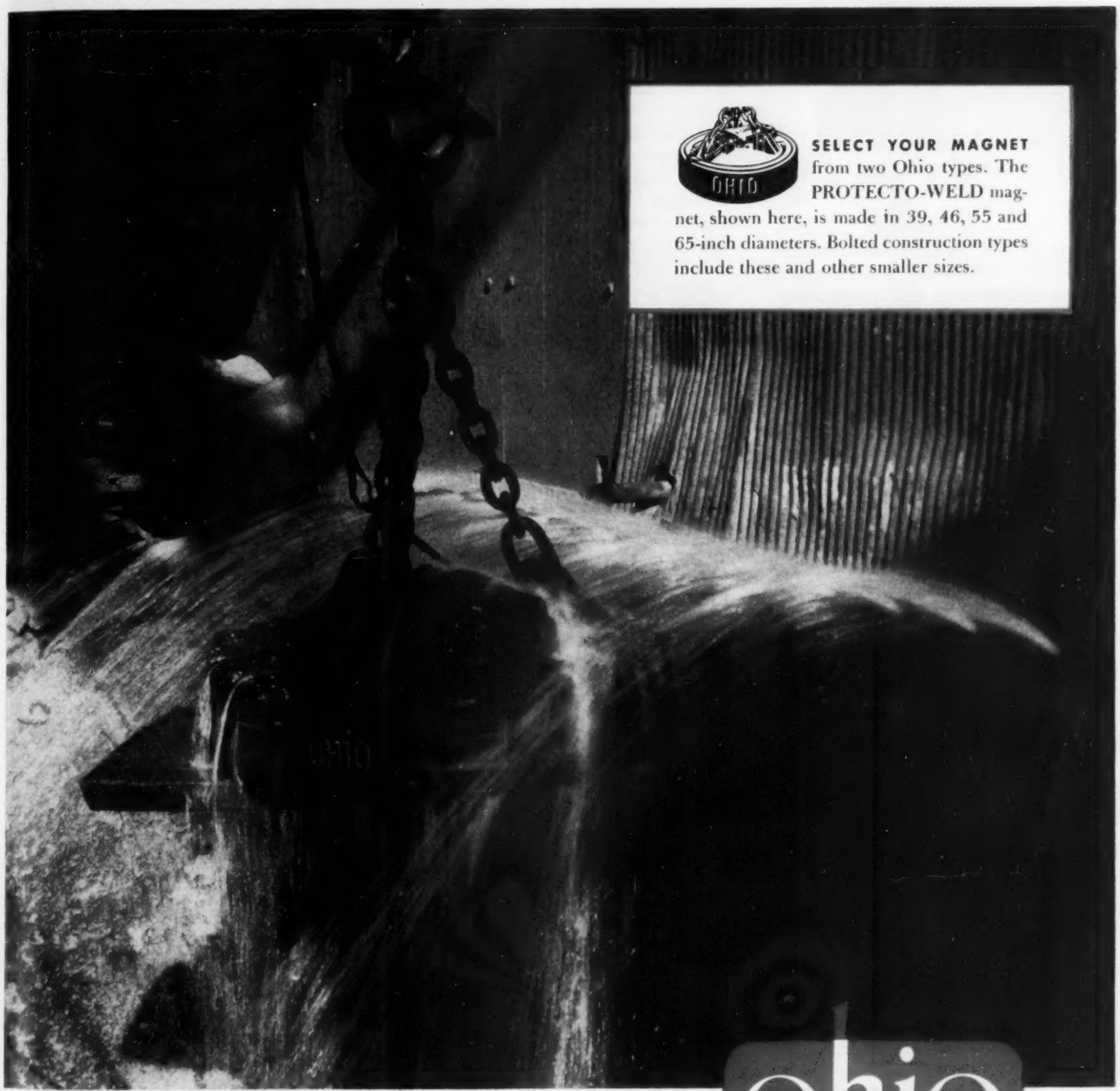
Is MOISTURE your magnet problem?

Here's an Ohio lifting magnet that operates underwater 50 percent of the time, retrieving hot crop-ends from a cooling pit. It is a standard Ohio bolted-type magnet which has not been waterproofed in any way!

This unusual application proves the extra margin of moisture protection built into every Ohio Magnet.

For longer magnet life and greater dependability, why not send your next order to Ohio—*25 years a leader in magnetic materials handling.*

Remember this picture next time you buy!



SELECT YOUR MAGNET from two Ohio types. The PROTECTO-WELD magnet, shown here, is made in 39, 46, 55 and 65-inch diameters. Bolted construction types include these and other smaller sizes.

THE OHIO ELECTRIC MFG. CO. • 5900 MAURICE AVENUE • CLEVELAND 4, OHIO

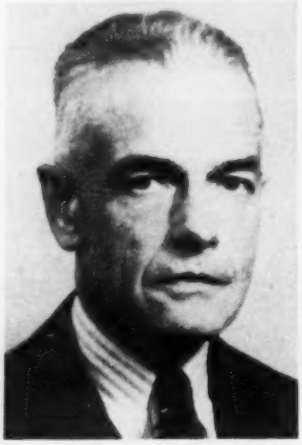
Ohio MAGNETS

A-1924

Carolina, Georgia and Washington, D. C., and will have headquarters in Philadelphia.

—o—

Clayton P. Yoder has been appointed



CLAYTON P. YODER

sales manager, Platecoil Division, **Kold-Hold Mfg. Co.,** Grand Rapids, Mich. His immediate activities will include establishing sales representatives in the leading industrial areas of the country. He will have charge of training personnel and general promotion of the products of the Platecoil Division.

—o—

John K. Bruce, designer of equipment for process industries, heads **Bruce Engineering Corp.,** San Francisco, recently formed to produce specialized marking and handling equipment for food packing plants, breweries, oil companies, and other packaging industries.

—o—

F. C. Tucker has been appointed purchasing manager, chemical department, Pittsfield, Mass., for **General Electric Co.** Until recently he has been assistant purchasing agent with Rohm & Haas Co. **William O'Neil Jr.** has been appointed plant manager of the Bowling Green, Ky., water cooler plant of General Electric's air conditioning department. Since joining the company in 1930 he has held various positions in planning and wage rate sections of the Erie, Pa., Schenectady, N. Y., and Ft. Wayne, Ind., works. **Robert J. Baumann** has been appointed an analyst in the marketing research section, marketing division, chemical department.

—o—

Joseph D. Kelly has been named sales promotion manager for passenger car and truck tires, **B. F. Goodrich Co.,** Akron.

—o—

Donald R. Wadle has resumed the position of commissioner of the **Metal Lath Manufacturers Association,** Cleveland, following a year's leave of absence because of illness. For the past 12 months this office was filled by **W. B. Turner,** who, until he retired in 1948, was manager, fireproof building materials department, Inland Steel Products Co.

—o—

Kurt A. Miericke has been appointed Chicago representative of **Michigan Oven Co.,** Detroit, to cover the sale of industrial ovens throughout northwestern Indiana, northern Illinois, Wisconsin and Iowa. He has been with U. S. Gypsum Co. as development engineer since 1944, and previously sold industrial x-ray equipment.

—o—

W. C. Chapman has been appointed senior field superintendent, **Freyn Engineering Co.,** Chicago, subsidiary of Koppers Co. Inc. **Robert K. Matthews** was advanced to general construction superintendent, and **Russell A. Powell** was appointed assistant chief engineer.

—o—

George E. Johnson has been appointed foundry superintendent, **New York Air Brake Co.,** Watertown, N. Y. He succeeds **L. W. Curtis,** retired after 22 years of service. Mr. Johnson has been with the company since 1915.

—o—

Cecil Packard has been named representative for **Arthur Colton Co.,** Detroit, in Michigan and western Ontario.

—o—

Frank J. Walton, former manager of sales, **Chandler-Boyd Co.,** Pittsburgh, has been elected to the board of directors, and also to position of vice president in charge of sales. **Byron B. Null,** former assistant controller, has been elected secretary-controller of the company to fill the vacancy left by the recent retirement of **W. W. Wiggins.**

—o—

J. J. Fitzpatrick and **R. H. Grimes** have been appointed district representatives, **Berger Building Products Sales Division,** Republic Steel Corp., Cleveland. Mr. Fitzpatrick will work out of the Indianapolis branch warehouse, and Mr. Grimes in a similar capacity at St. Louis.

—o—

Edward G. F. Arnott has been named acting research director, Lamp Division, **Westinghouse Electric Corp.,** at Bloomfield, N. J. Mr. Arnott, a specialist in the study of gas discharges for fluorescent lamps and electronic tubes, succeeds **Dr. Charles M. Slack,** recently appointed technical director, Atomic Power Division, Pittsburgh. **Ray H. Timmons** has been appointed manufacturing manager of industrial products for the corporation. **C. M. Clark,** formerly superintendent of manufacturing, Transportation & Generator Division, succeeds Mr. Timmons as manager of manufacturing for that division.

—o—

Foote Mineral Co., Philadelphia, announces addition of five men: **Harry B. Hunter** joins Foote research and development laboratory as a metallurgist; **J. M. Kishel** as a chemist, analytical section of the laboratory; **Edward Loveland,** ceramic research assistant; **Dr. Everett R. Johnson** as a research chemist for the corporation; and **David Coghlan** as a chemical engineer to conduct pilot plant studies for the research and development laboratory.

—o—

Dr. Nicol H. Smith has been appointed director of research operations of **Franklin Institute Laboratories,** Philadelphia.

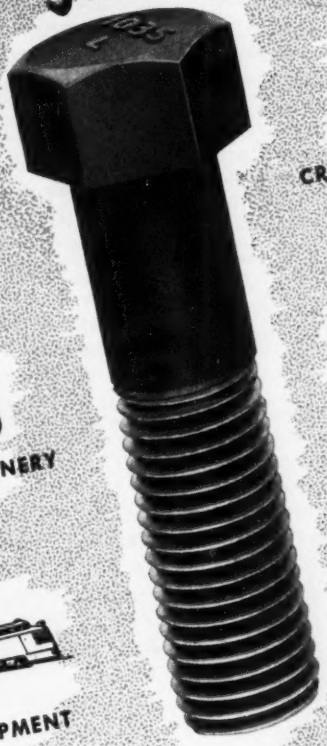
—o—

R. W. Markley Jr., assistant to the

FRANK J. WALTON

BYRON B. NULL

PLENTY TOUGH when the going's ROUGH!



TRACTORS

CRANES • POWER SHOVELS

TRUCKS AND CARS

ROAD BUILDING MACHINERY

HEAVY INDUSTRIAL MACHINERY

RAILROAD EQUIPMENT

LAMSON "1035" CAP SCREWS

Toughness . . . Strength . . . Precision

Accurately headed, precision threaded and *plenty rugged*—
that, in a nutshell, describes Lamson "1035" Cap Screws.

Lamson pioneered the "high tensile" Cap Screw after years of research and "on the job" testing.

Today's "1035" product is precision-made on the finest type of bolt-making machinery—and heat-treated automatically in furnaces where the atmosphere is scientifically controlled.

As a result, the modern Lamson "1035" Cap Screw is unmatched for strength, toughness and all-round quality.

That's why you'll be way ahead always to say "Lamson" *before* you say "Cap Screws."

THE LAMSON & SESSIONS COMPANY

General Offices: 1971 West 85th Street, Cleveland 2, Ohio

Plants at Cleveland and Kent, Ohio • Birmingham • Chicago

Lamson & Sessions

"One Dependable Source for All Fastener Needs"

SEMS	LOCK NUTS	NUTS	STUDS
STOVE BOLTS	LAG BOLTS	WASHERS	RIVETS
TAPPING SCREWS	ROPE CLIPS	SET SCREWS	PLOW BOLTS
"1035" CAP SCREWS	MACHINE BOLTS	CARRIAGE BOLTS	COTTER PINS

—CUT ALONG THIS LINE—

WANT MORE INFORMATION on any of these fasteners? CHECK—and CLIP this strip.

LAMSON LOCK NUTS: Economical, vibration-proof. Can be re-used repeatedly.

"1035" SET SCREWS: Cup point type, hardened, heat-treated.

COTTER PINS: Steel, Brass, Aluminum and Stainless Steel.

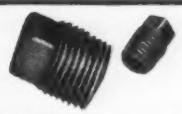
SPECIAL NUTS: Cone, Barrel, Oblong, Plier, Tri-Slot, Half-round, etc.

PHILLIPS AND CLUTCH HEAD: Machine Screws and Tapping Screws.

MILLED STUDS: Concentric, accurate, in a full range of sizes.

"BENT" BOLTS: Including U Bolts, Eye Bolts, Hook Bolts, etc.

WEATHER-TIGHT BOLTS: Eliminate counter-boring in wood assemblies.



PIPE PLUGS: Forged Steel, heat-treated.

The Lamson & Sessions Company
1971 W. 85th St., Cleveland 2, Ohio

NAME

POSITION

COMPANY

STREET

CITY ZONE STATE

director of contract requirements, Douglas Aircraft Co. Inc., Santa Monica, Calif., has joined **Aircraft Industries Association** as assistant to the director of the industrial planning service.

—o—

Roy C. Menzel, works manager at

ROY C. MENZEL

the Los Angeles plant of **General Metals Corp.,** Oakland, Calif., has been promoted to secretary and treasurer of the corporation, with headquarters at the Oakland plant. He has been connected with the corporation for the last 25 years, most of which has been spent in the southern California area.

—o—

George Gorton III, executive vice president and general manager, **George Gorton Machine Co.,** Racine, Wis., has accepted membership on the American Management Association production council.

—o—

Charles F. Colbert Jr. has been re-elected president and general manager, **Pittsburgh Metallurgical Co.,** Niagara Falls, N. Y., for the 11th consecutive year.

—o—

C. A. Mapp has been appointed district sales representative, and **H. D. Buckner,** service supervisor for diesel locomotives in a diesel locomotive sales and service office opened in Cleveland by **Fairbanks, Morse & Co.,** Chicago. They will be located in the company's branch office, 2810 Superior Ave.

—o—

E. H. Ehlert has been appointed region manager of industrial cleaning equipment and chemical sales for midwestern states by **Detrex Corp.,** Detroit. Mr. Ehlert has been with the company since 1943 and since 1948 has been manager of the Detroit industrial sales office. In his new post he will be stationed in Chicago. **W. J. Miller,** who also joined the firm in 1943, will be in charge of field application of Detrex alkali and emulsion cleaning compounds for the midwestern states.

—o—

Liquid Plastics Division, **Ferro Enamel Corp.,** Cleveland, announces appointment of **O. P. Taylor** to handle sales of Vedoc organic industrial finishes in northern Ohio and **G. J. O'Roark** to act in a similar capacity in the Chicago area.

—o—

William A. Henderson has been appointed Detroit district sales representative of **Fort Duquesne Steel Co.,** Pittsburgh, and its affiliate, Hamilton Steel Co., Cleveland. Until recently, Mr. Henderson was Detroit representative for Ohio Stainless & Commercial Steel Co. and previously represented Eberhard Mfg. Co. in the Detroit area for 20 years.

—o—

Harold R. Ryan has been transferred

HAROLD R. RYAN

to the Youngstown district as superintendent of the Brier Hill open-hearth department of **Youngstown Sheet & Tube Co.** He succeeds **Paul Johnson** who recently left the company. Mr. Ryan joined Youngstown Sheet & Tube in 1937. In February, 1947 he was appointed a practice engineer in Brier Hill open-hearth, and the following September was transferred to the Indiana Harbor plant, Chicago district, as assistant superintendent of the open-hearth department.

—o—

G. L. Gabrielson has been appointed sales agent in the Pittsburgh office of **American Car & Foundry Co.,** New York. He formerly was in the miscellaneous products division of the company's sales department in New York.

—o—

H. Edward Neale has been appointed Chicago direct representative for **Bullard Co.,** Bridgeport, Conn., working in conjunction with Marshall & Huschart Machinery Co. He takes the place of the late **George York.**

—o—

Wayne Karber has been appointed sales engineer in charge of cast stainless steels by Wm. G. Boales & Associates, Detroit, to handle and coordinate activity concerned with **Cooper Alloy Foundry Co.'s** line of valves, fittings, accessories and engineered castings.

—o—

Arthur Kuiper has been appointed treasurer of **Continental Foundry & Machine Co.,** East Chicago, Ind. Formerly controller, Mr. Kuiper succeeds **W. L. Spencer,** retired.

—o—

Francis J. Sehn has been added to the staff of the Detroit office, **Clearing Machine Corp.,** as a sales engineer. He previously was chief die engineer for Fisher Body Tank Division, General Motors Corp.

—o—

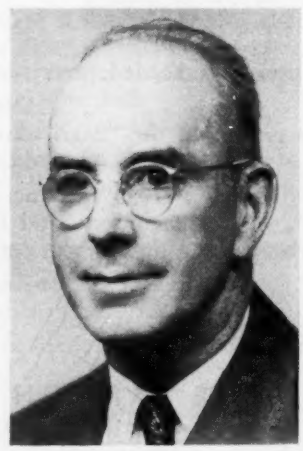
V. C. Dollman has been appointed Pacific Coast sales manager for **Wheeling Steel Corp.,** Wheeling, W. Va. He will make his headquarters in San Francisco. Mr. Dollman, who has been resident sales representative in Indianapolis, replaces **K. P. House** who will come to Wheeling as assistant manager of the pipe division.

—o—

William Pohn, Pohn Iron & Steel Co., Chicago, was re-elected president, **Chicago Chapter, Institute of Scrap Iron & Steel Inc.**

—o—

Elmer H. Riddle has been appointed



ELMER H. RIDDLE

superintendent of the blast furnace department, Aliquippa Works, **Jones & Laughlin Steel Corp.,** Pittsburgh. He formerly served as assistant superintendent, and has been associated with the blast furnace department for the last 22 years.

Gerard M. Haley has been appointed

GERARD M. HALEY

director of purchases, **Chevrolet Motor Division,** General Motors Corp., Detroit. Formerly purchasing agent at the Chevrolet central office, he replaces **R. G. Ford,** who was promoted to manager of assembly plants. Six other appointments announced simultaneously are: **E. F. Gormsen,** formerly purchasing agent, Chevrolet gear and axle and forge plants in Detroit, promoted to purchasing agent, central office; **E. J. Furbacher,** assistant purchasing agent, central office, becomes purchasing agent, gear and axle and forge plants; **Milton J. Schemm,** purchasing agent, Chevrolet-Toledo plant, promoted to assistant purchasing agent, central office; **Kenneth V. Daniels,** a divisional buyer, central office, becomes purchasing agent at the Toledo plant; **George B. Ford,** purchasing agent, Chevrolet parts manufacturing plant, Saginaw, Mich., appointed purchasing agent, Saginaw gray iron foundry, succeeding **John M. Hance,** retired; **Carl S. Allemang,** a divisional buyer, central office, promoted to purchasing agent, parts manufacturing plant, Saginaw, succeeding Mr. Ford.

—o—

E. E. Baker has been elected vice president, Public Works Pump Division, **Hamilton-Thomas Corp.,** Hamilton, O., and **W. G. Rosendahl,** as vice president of the Machine Tool Division. Mr. Baker joined Economy Pumps, division of Hamilton-Thomas Corp., in 1945 as manager of distributor sales, and Mr. Rosendahl joined the company as general superintendent in 1941, later serving as assistant manager and then manager of sales of its Liberty Planers Division.

—o—

J. T. Rimer Jr. has been appointed assistant to the president, in charge of industrial and public relations, for **Universal-Cyclops Steel Corp.,** Bridgeville, Pa. He has been associated with the firm since 1943 as director of personnel.

—o—

Ampco Metal Inc., Milwaukee, has appointed **J. A. Arter** as assistant general manager. He joined the company in 1937 and since 1945 has been staff assistant to the general manager.

—o—

Harold H. Keays has been named superintendent of production at the Los Angeles **Lincoln-Mercury** plant, Ford Motor Co. He formerly was superintendent of the trim department at the Detroit Lincoln plant.

Melville Morris has been elected

MELVILLE MORRIS

president of **Optimus Equipment Co.,** Matawan, N. J. He has been executive vice president of the company, which is a subsidiary of Hanson-Van Winkle-Munning Co., also located in Matawan.

—o—

Solar Aircraft Co., San Diego, Calif., announces the following personnel changes: **Earl D. Needham,** formerly assistant purchasing agent at the Des Moines, Iowa, plant, has been promoted to purchasing agent; **Philip L. Ward** has been transferred from the Contract Administration Division, Des Moines plant, to manager, contract administration office, 1025 Connecticut Ave. N. W., Washington; **John W. Parsons** has been transferred from the contract administration office in New York to manager, contract administration office, 120 W. Second St., Dayton, O

OBITUARIES...

Arthur H. Oberndorfer, 62, advertising manager, **Hevi Duty Electric Co.,** Milwaukee, died Oct. 13 while enroute to Cleveland to attend the 31st National Metal Congress & Exposition.

—o—

Paul W. Lyon, manager of market research, **Wheeling Steel Corp.,** Wheeling, W. Va., died Oct. 14 after an illness of several months. He had been associated with Wheeling Steel for 15 years. He had previous association with American Sheet & Tin Plate Co. and Carnegie-Illinois Steel Corp. Mr. Lyon joined the tin plate sales division of Wheeling Steel in 1934 and in 1943 assumed duties in war relations and became manager of market research for the corporation.

—o—

John H. Brown, 35, personnel manager and a director of **Brown-Boggs Foundry & Machine Co. Ltd.,** Hamilton, Ont., died Oct. 9.

—o—

George A. Cardwell, 67, manager, alloy sales, **Lukens Steel Co.,** Coatesville, Pa., died Oct. 13. He had been associated with Lukens since 1927 when he joined the company as a salesman. He was named manager of alloy sales in 1932.

—o—

August J. Marohn, former owner of **Albany Wire Works,** Albany, N. Y., died Oct. 9. He operated the wire works for 38 years until he retired in 1929.

—o—

William H. Taylor, 61, Adrian, Mich., western division sales manager of **Toledo Steel Products Co.,** Toledo, O., died Oct. 7 from injuries received Sept. 19 when he was struck by a bus in Dallas while on a business trip. He had been associated with the steel firm 25 years.

—o—

Harry P. Jenson, 64, associated with **Cleveland Twist Drill Co.,** Cleveland, for 44 years, died Oct. 17. He held the positions of assistant manager of sales and export sales manager of the company.

—o—

Herbert H. Leader, 55, development engineer and manufacturer, died Oct. 2 in Rochester, N. Y. He formerly was chief engineer for **F. A. Smith Mfg. Co.** and also was associated with **Weber Machine Corp.**

—o—

Arthur S. Bland, 68, retired sales engineer, **Mississippi Valley Structural Steel Co.,** Decatur, Ill., died Oct. 16 in St. Louis. He had been in retirement for the last three years because of illness.

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Engineering News . . . AT A GLANCE

CUTS PRODUCTION STEPS— Metal products can be given a bright, reflective surface without mechanical or electrical operations by a new process developed by Battelle Memorial Institute, Columbus. Referred to as chemical polishing, the method eliminates as many as four or five production steps in finishing a metallic product. Work involved consists merely of dipping the product to be finished into a solution and withdrawing it a few minutes later—polished to a mirror-like luster. Process is especially advantageous in polishing items of intricate form. Also surface obtained may serve as a base for subsequent plating. Brass, copper, nickel-silver, Monel, nickel and aluminum may be polished successfully by the method.

ATOMS FOR TRACING RUST— Radioactivity may be the answer in learning how to control common rust. In experiments using radioactive tracers General Electric engineers in Schenectady, N. Y., discovered a method that reveals photographically how and where rust starts and how deep it goes. Technique involves electroplating a solution holding radioactive iron on the surface of the metal then placing a photographic plate against this surface leaving it thus several days. During this time an x-ray exposure is made on the plate by the radioactive coating. As the test piece rusts, a decrease in radiation results, showing up graphically as lighter areas on the photographic plate. A series of these "autoradiographs" shows nature of the rust forming.

COST-REDUCING PROCESS— Karat gold now can be rolled to a mirror finish and as thin as electroplate on any nonferrous metal base by a process developed by American Silver Co. Inc., Flushing, N. Y. Method avoids use of expensive polishing and electroplating operations after fabrication usually required to achieve the gold color. Essentially, process consists of welding the gold layer to a barrier layer of pure nickel, then soldering the dual thickness to the base metal in the conventional manner. By welding and introducing the barrier layer of metal, "bleeding" is overcome completely. Development is expected to cut manufacturing costs of fountain pens, watch cases and bands, buckles and many optical items.

PROVIDES QUICK ANALYSIS—New sensitive test method of making hydrogen analysis in steels is expected to lead to more efficiently controlled qualities in the metal, according to the Office of Naval Research. Amount of hydrogen in a melt of steel can be checked in about 15 minutes by the technique.

SPEEDS UP DRILLING— Drilling of multiple holes in various types and sizes of steel plates and housings is greatly simplified by making use of an adjustable index table with a vertical boring mill at the Sunnyvale, Calif., plant of Westinghouse Electric Corp. Work is speeded up some 60 per cent as, once the setup is made, any number of subsequent operations may be repeated on both sides of the piece. Operation is basically simple: Jig containing the piece is placed on the pre-indexed table which turns on a vertical plane. Drill head is quickly placed in position for any number of holes desired on the top surface. When this surface is finished, jig and piece inside it can be "flopped" in a few seconds with the aid of a hoist.

NEW ROD MILL—Installation of a new rod mill at Colorado Fuel & Iron Corp.'s Minnequa Works at Pueblo, Colo., increases the company's former rod capacity more than 65,000 net tons annually. The latest facilities roll, in 27 passes, 4⅜-inch square billets into finished coiled rods in form of 700-pound bundles. (p. 58)

ENFORCED CONTROL—In producing bronze bearings in the Allison Division of General Motors, Indianapolis, careful control is enforced on all melting and casting operations. Highest grade metals are used for all bronze melting. Pouring is done directly from crucible into the welded steel flask assembly. This permits closer control of metal temperature. Alloys employed are subject to segregation if the temperature is permitted to fall 50° F below the optimum pouring temperature before quenching. (p. 61)

INSPECTION PLUS—Because of the close tolerances required and the commercial use of a forged part, inspection of precision-forged turbine blades and buckets cannot be stressed too highly. To insure quality control, five major steps are employed in the inspection procedure at Steel Improvement & Forge Co., Cleveland. These include: Preparatory layout and engineering, die forge, hardness and final inspections. On some compressor blades currently used in Air Force fighters, preparatory layout and inspection procedure involves as many as 11 different sectional layouts. (p. 66)

LARGE SCALE DELIVERY — One of the most interesting, potentially valuable contributions to the art of making seamless pipe is the so-called "continuous-tube rolling mill." Essentially, it is similar to a modern strip mill so far as processing the product is concerned. Its use is considerable in both this country and Europe, but nowhere on as substantial a scale as one now being constructed by National Tube Co. This unit is designed to deliver pipe 65 feet long in sizes 2 to 4½ inches at rates up to 900 feet per minute out of the last stand of rolls. After further processing in a stretch reducing mill, lengths up to 400 feet and delivery rates as high as 2200 feet per minute are expected to be attained. (p. 68)

NEW ROD MILL

To Increase Production

At Colorado Fuel and Iron Corp.

Nearly 50 years of rod making "know how" is combined in the new facilities recently placed in production at the company's Pueblo plant. Operators believe their $5 million mill is among the most modern units of its type in the country

INCREASED production of coiled rod in 700-pound bundles is being afforded Colorado Fuel and Iron Corp. with the installation of the new rod mill at their Minnequa Works at Pueblo, Colo. Replacing a Garrett mill installed in 1903, the new rod rolling facilities will increase the company's former rod capacity more than 65,000 net tons annually.

The new mill will roll from 4⅜-inch square billets through 27 passes into finished coiled rods. Four of the 27 stands will break the square billets down to a 2½-inch square, after which they will pass through a 23-stand Morgan rod mill proper of more or less present-day conventional type.

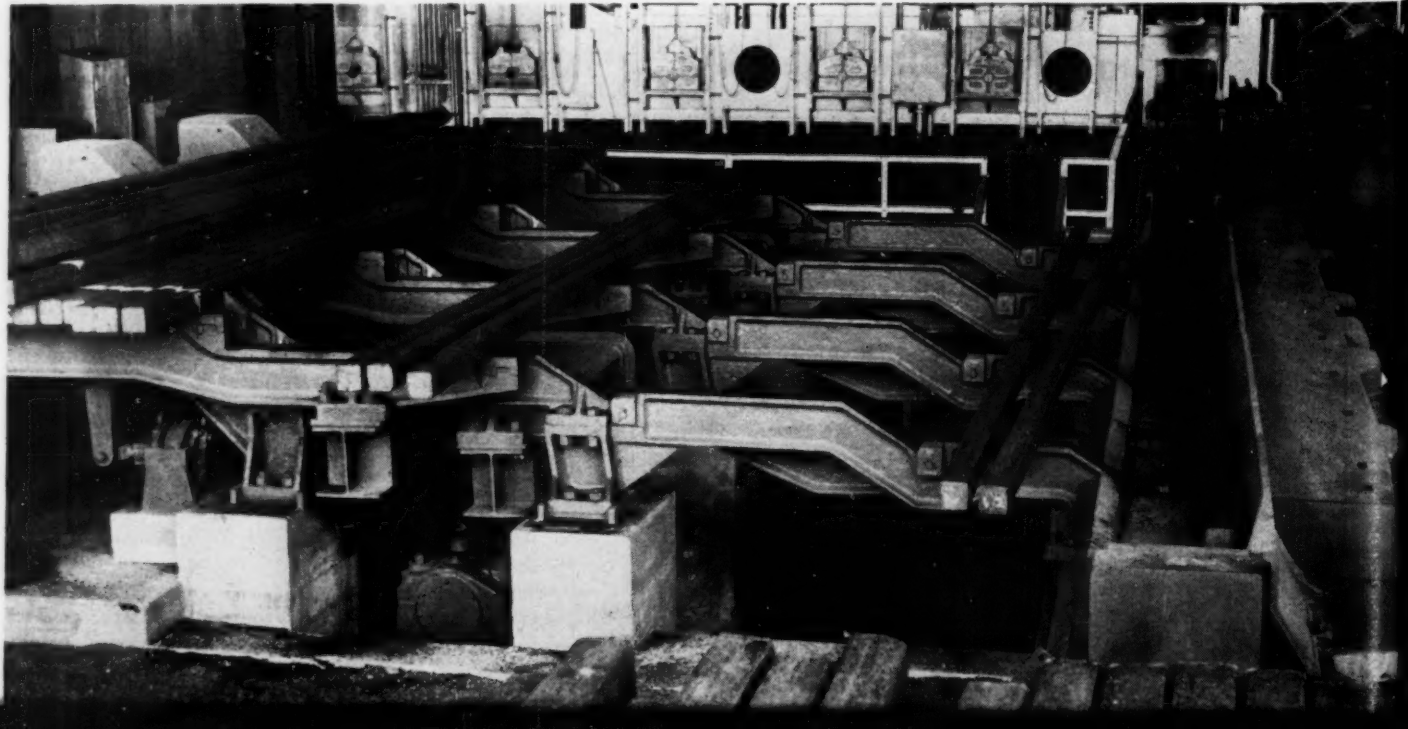
The initial billets will be rolled in the existing rail mill, sawed into approximately 22-foot lengths and passed over cooling beds where the temperature will be reduced to approximately 700° F and delivered to a heavy-section billet yard operated in conjunction with the finishing end of the rail mill. Here they will be handled by a 12½-ton overhead magnet crane and loaded either directly into special billet cars or stored in a billet yard at that location and later transported by billet cars to the rod mill.

Bundles of rods, ranging from No. 5 gage up to and including ⅜-inch diameter, will be delivered from the mill to six laying reels, which, in turn, will deliver the bundles to two flat conveyors—three reels serving each conveyor. Sections heavier than ⅜-inch diameter will be delivered to heavy type pouring reels and delivered to an extension of one of the flat conveyors. The mill will handle all sizes from No. 5 rod up to and including 1¼-inch rounds.

From the flat conveyors the bundles will be carried by hook conveyors, 1400 feet long, having approximately 900 feet of effective cooling length to an unloading station where they will be loaded onto an electrically operated shuttle car system, which will transport them in carload lots to the wire mill docks or to the wire mill cleaning house direct, as required.

Novel Billet Handling—The combined billet yard and furnace building has a span of approximately 96 feet and is 250 feet total length. Of this length, 125 feet is shared by the furnace building and part

Fig. 1—First machine ever built for the unscrambling of billet loads. As much as 27 tons can be handled by the unit which also straightens the material and shuffles it to the furnace charging table. No labor is required at the machine, thus eliminating a hazardous occupation



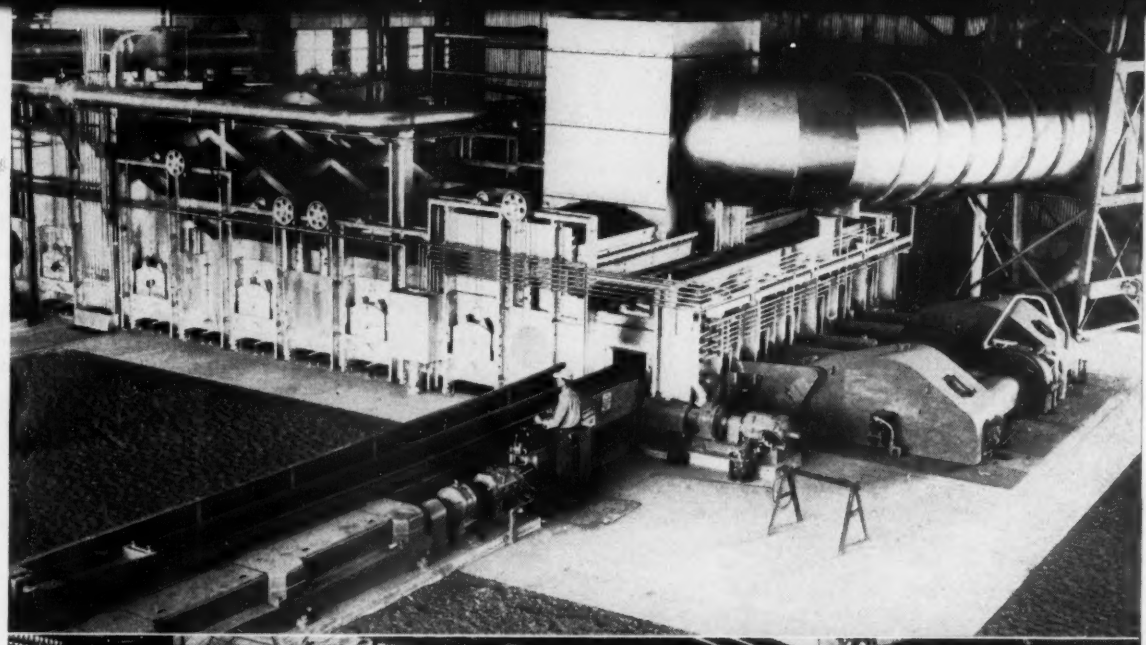


Fig. 2 — Entry end of heating furnace which can handle 60 tons of billets hourly. It has a hearth 26 x 69 feet long

Fig. 3 — Single strand four-stand breakdown mill which takes the billets down to 2½-inch squares and larger prior to entering the holding furnace

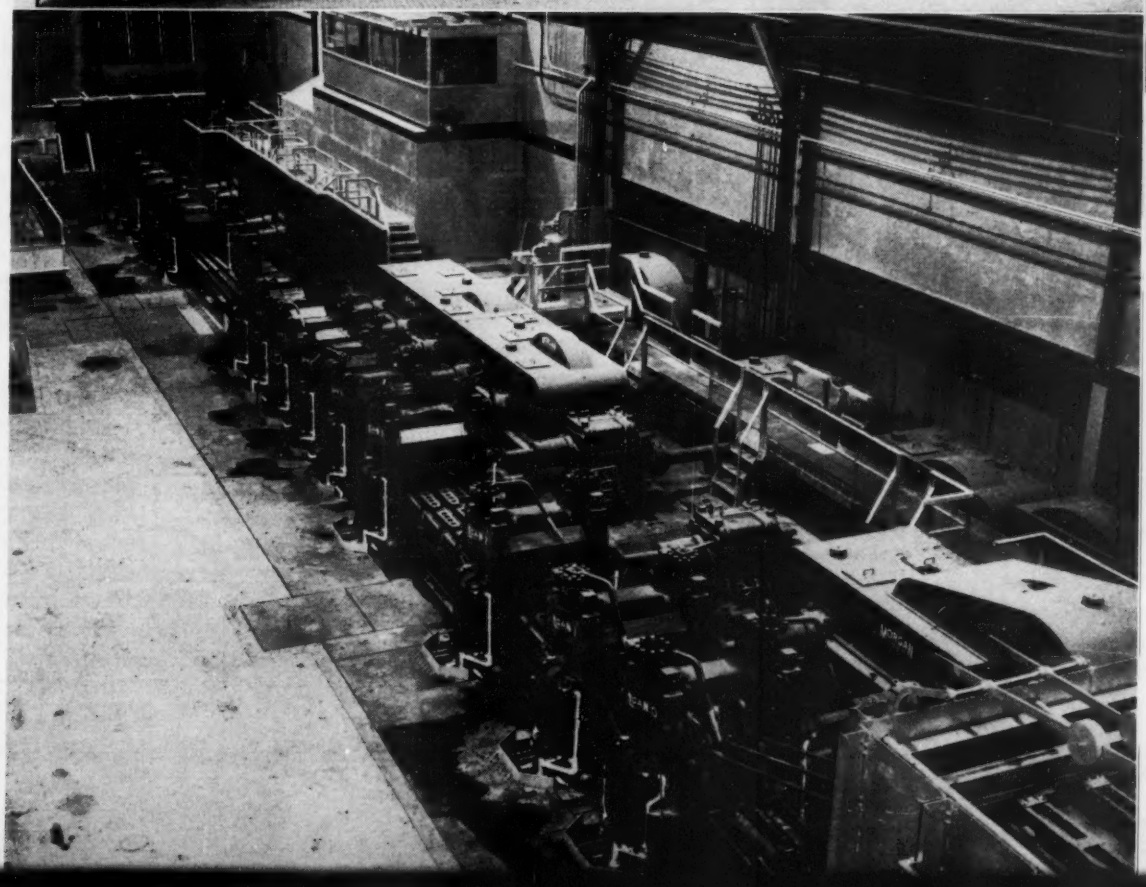


Fig. 4—View of end of holding furnace and rod mill proper. Three strands of rod travel simultaneously through these stands at an estimated speed of 156 miles per hour

of the billet yard. A 15-ton Cleveland magnet crane serves the entire area. Billets from special billet handling cars will be lifted from the cars and placed into storage racks or taken directly to a billet arranging machine. Storage space has capacity for approximately 8000 tons of billets. The billet arranging machine, furnished by the Morgan Construction Co., is the first of its kind to have been built. Billet lifts of approximately 9 tons up to a total of 27 tons, comprising approximately a 45-minute supply reservoir, may be deposited at a time on the machine which will transfer the billets sideways to the furnace charging table. Should the billets, for any reason, become out of line, they will be put in to alignment by the machine and then shuffled to the furnace charging table. This machine is operated by the furnace charging man from a control station at the furnace charging station. No labor is required.

The furnace, which is of the double combustion zone type, was designed, fabricated and erected by the Rust Furnace Co. It is side charge, side discharge type. All furnace charging equipment was furnished by Morgan. The furnace has a rated capacity of 60 tons per hour, and the hearth is 69 feet, 8½ inches long by 26 feet wide, including the soaking zone at the discharge end. The furnace is operated with full automatic control.

Billets from the furnace are delivered to a single-strand Morgan continuous breakdown billet mill, comprising four stands which reduce the billet to 2½-inch square, plus or minus as required.

Leaving the breakdown mill the billet is received on a holding furnace charging table where it is divided into two 34-foot lengths before entering the furnace, which has a 6-foot hearth and is 37 feet wide. It was designed by Morgan and fabricated and erected by Colorado Fuel and Iron Corp. This furnace not only controls temperature of the billet from end to end as desired, but also serves as a billet reservoir in front of the rod mill proper, which generally is of the modern conventional Morgan type comprising nine continuous roughing stands.

Following the ninth stand is located a crop shear where the length of the crop to be cut is automatically determined. Following and also in line with the roughing mill there are five (*Please turn to Page* 82)

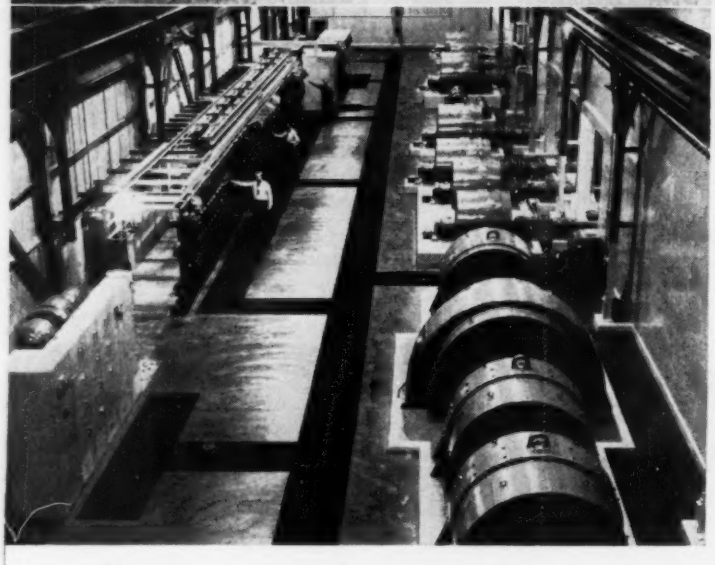
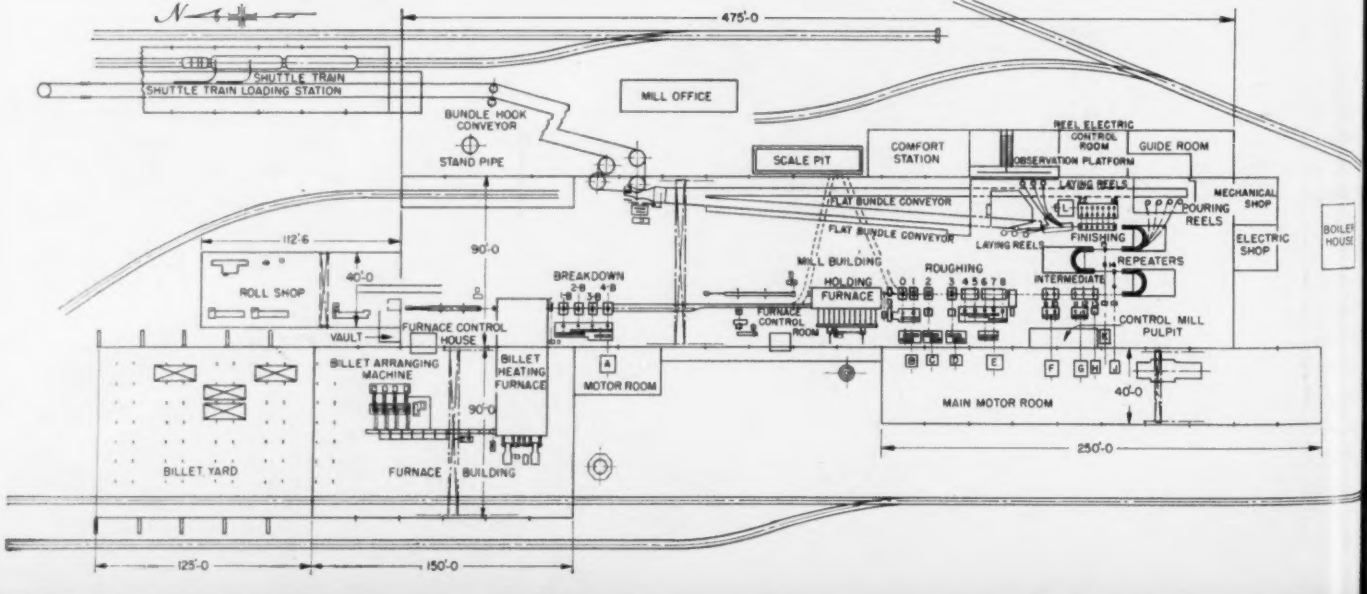


Fig. 5—(top) Control pulpit is at right and delivery tubes which carry the material from last finishing stand to coilers are seen in center, behind is seen the repeating arrangement

Fig. 6—(center) Motor room which is kept under positive pressure with the basement under partial vacuum in order to circulate air through the mill motors

Fig. 7—(below) General plan of new rod mill



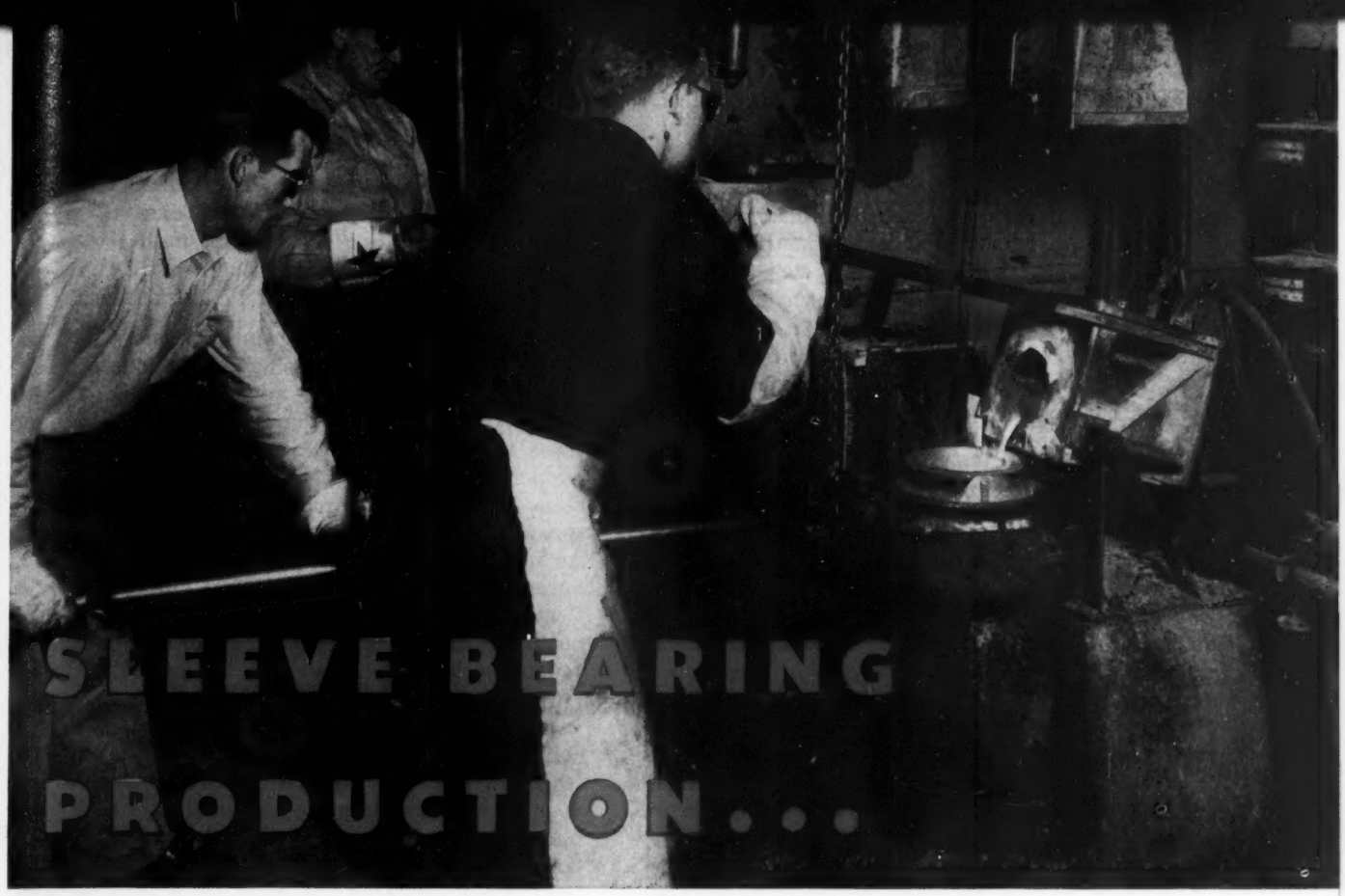


Fig. 1—Pouring molten bronze from induction melting furnace into a steel flask supported in a pot in which the flask containing a steel sleeve was previously heated. Bronze bonds to sleeve and flask in quenching

Involves Unusual Casting and Machining Procedures

By HERBERT CHASE

HIGH precision methods employed by the bearing plant of Allison Division, General Motors Corp., Indianapolis, in the manufacture of sleeve type bearings were extended during the war to the production of millions of aircraft engine bearings. These same precision practices which were developed over a period of more than 25 years continue to be used in the processing of much larger bearings used in diesel engines. Some of these bearings used in diesel locomotives are reported to have seen service in excess of 2 million miles, and were still found in serviceable condition when dismantled for inspection.

Production methods used in casting and machining these bronze bearings are unusual and in some respects are unique. A portion of the production is made with bronze layers bonded to both sides of the low carbon steel backings. It is possible to make these bronze layers of different compositions, if desired. This type of construction is often found necessary in the connecting rod construction used for V-type engines, with both forked and blade type connecting rods used on the same crankshaft journal. Because of the low rubbing speed of the blade connecting rod on the outer bronze coating, the outer bronze may be harder than the inner bronze which aids in the long life experienced with many of these bearings.

Allison Division bearing plant can cast any bronze composition suitable for bearing applications. In recent years, however, some of the compositions pioneered by the company have been standardized by engineering groups such as the Society of Automotive Engineers. These standard compositions form a large part of the material cast at the present time. Typical compositions used are 25 per cent lead, 3 per cent tin, 72 per cent copper, and 15 per cent lead, 10 per cent tin, 75 per cent copper. The tin contents in the bronze are commonly reduced for use with crankshafts or other journal surfaces which are not hardened.

High Grade Metals Used—A careful control is enforced on all melting and casting operations. The highest grade metals are used for all bronze melting, with some of the melts being made up from the individual components and others from material purchased in the form of ingots made to specifications desired.

All melting is done in electrothermic induction furnaces using clay graphite crucibles such as shown in Fig. 1. Pouring is done directly from the crucible into the welded steel flask assembly. Direct pouring is used because it permits a closer control of metal temperature. Alloys used are subject to segregation if the temperature is permitted to fall 50° F below the optimum pouring temperature, before quenching. For diesel bearings, most of which are

two to three times larger than average aircraft engine bearings, three to five bearings are commonly poured per heat.

Steel sleeves used as bearing backings are machined close to size, then ground both inside and outside. While the grinding is done primarily to permit holding accurate sizes on the steel surfaces underlying the bronze, it also provides an excellent surface for bonding the bearing metal.

Steel flasks are used because they are moderate in cost, provide annular recesses in which to pour bronze in concentric layers of desired thickness and aid in the rapid quenching that is necessary to yield the desired grain structure.

Outer Walls Stepped—Shells forming flask walls are drawn from sheet steel 0.060-inch thick and each has an outward flange when forming the inner wall of the flask or an inward flange in the case of outer flask walls. When both are used with steel sleeves that are to receive bronze on both sides, the outside and inside diameters of the respective flanges are trimmed so that they fit each other. Inner flask walls are true cylinders but outer walls are stepped in such a way as to provide decreased thickness toward the bottom of the flask. This change in thickness affects the cooling rate after casting the bronze and is provided to insure the desired shrinkage rate in quenching. The flasks are expendable, being machined away on the first turning and boring operations performed on the cast assembly.

To keep the flask parts in correct relative location both to each other and to the sleeve, the flask cup or cups are welded to the sleeve. After welding, the flask is ready to go to the furnace where heating is done before pouring.

Before heating, however, the welded assemblies (whose components are well cleaned before being welded) are filled with a granular flux which melts and cleans the steel surfaces as heating progresses. The liquid flux remains in the assembly until, during pouring, it is displaced by the liquid bronze. This procedure keeps the steel surfaces from oxidizing and insures the perfect bond with the steel backing that is essential for a good steel backed bearing.

For heating, each flask is placed in a covered pot made from a heat resisting alloy and remains in this pot until the heating and casting is completed. As casting proceeds (Fig. 1) the flux displaced overflows into the pot and is recovered. Use of pots is convenient and also helps to keep the bronze above the segregation temperature until the casting, still in the flask, is quenched. This quench immediately follows the removal of the flask from the pot.

Water or Oil Quench—Quenching is a highly important step in the processing and is done in special machines, one of which appears in Fig. 2. For heavy bearings, the quench is water, but oil is sometimes used for lighter bearings. In both cases, the temperature of the quenching medium is held within close limits and the quench medium is applied by spraying radially inward from a surrounding tube. As quenching is done, the flask is rotated and is lowered slowly in such a way that progressive solidification at the desired rate occurs. This rate is positively controlled and is varied to suit the size and weight of bearing, as well as to control shrinkage.

When quenching is complete, the flasks are elevated and removed and are ready for transfer to machining. In the latter, since the flasks are bonded to the bronze, they have to be cut away, this being done by boring and, in the case of sleeves with bronze outside as well as inside, by turning also. The bottom of the flask also is cut off and both ends of the bearing are faced and often are chamfered. These operations expose the bronze on the ends and also on the surface of surfaces that, when further machined, become the bearing surfaces.

Bearings that are to be split are cut longitudinally into two halves in a milling operation after rough machining of the bore and ends. The milling cuts make the inner and outer surfaces slightly less than half-cylindrical. To produce full half cylinders by making up for the thickness of the milling cuts, a forming operation is performed in a large hydraulic press setup, Fig. 3.

In this operation, the outer diameter of the steel backing is forced into a hardened steel die and sufficient pressure is applied to exceed the elastic limit of the half sleeve. Actually, the pressure is about 70,000 pounds per square inch of projected area and

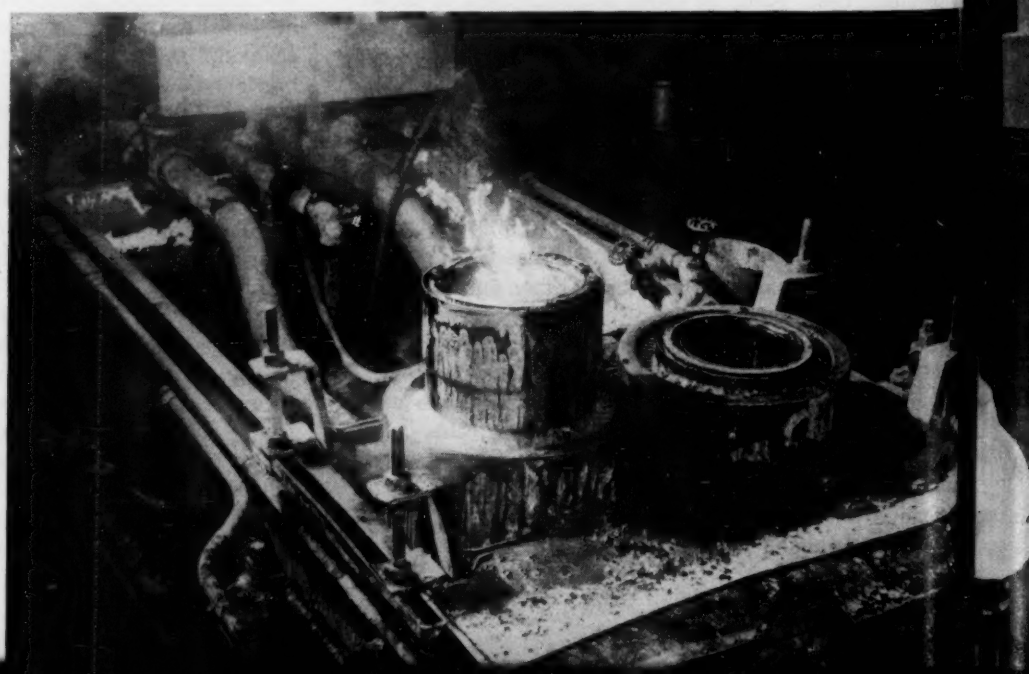


Fig. 2—Machine in which steel flasks and bronze in their annular recesses are quenched in water or oil sprayed radially against outer surfaces as flask is slowly lowered into quenching tube

is sufficient to effect some coining or at least enough permanent set to make the outer surface of the bearing a part cylinder of smaller diameter than before. This half sleeve has to be somewhat more than a full half cylinder because the longitudinal surfaces, where the prior milling cut was made, have to be faced in a shaper and later are found to hold close dimensional limits.

Finish Turning—The semifinish cut on the bronze bore is made on the half bearing in a precision boring machine, using a carbide tool. After the shaper cut on the split faces, two half bearings are clamped on an arbor to finish turn the outer diameter of the sleeve. This is followed by grinding on the same arbor in an external grinder. Then each half goes to a surface grinder for final finish of the split face. This is done in a fixture that locates on outer diameter and clamps on inner diameter.

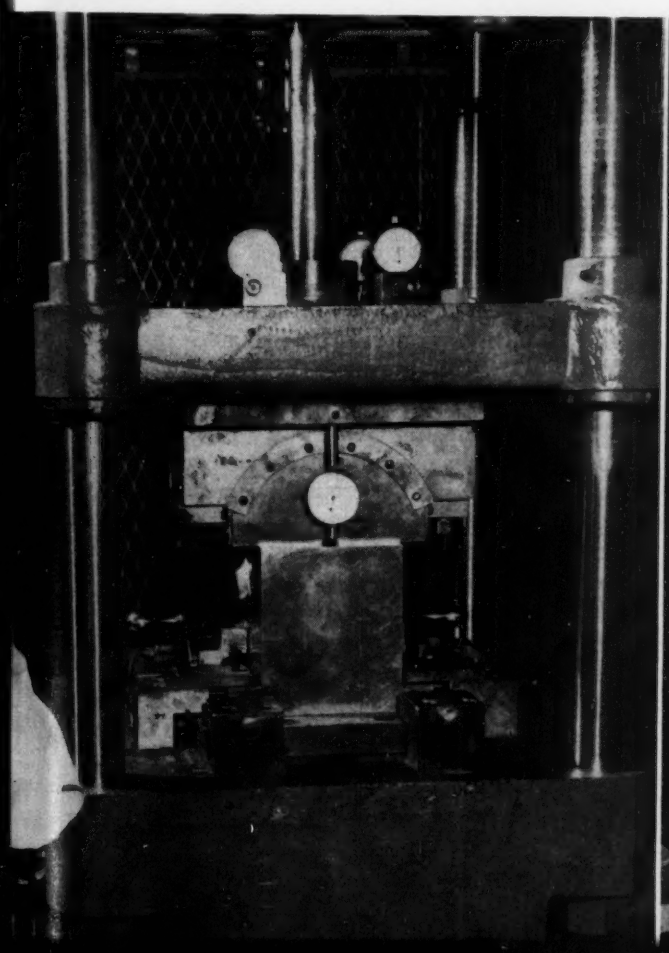
Height in this grinding has to be held within plus or minus 0.0005-inch or less on many bearings. This necessitates a special checking fixture, Fig. 4, in which the bearing is clamped in the cylindrical recess of a heavy half sleeve that fits the outer diameter and rests above on needle bearings that permit this half sleeve to rock. The fixture is in a press that applies a load equal to bearing capacity, say 14,000 pounds, exerted by a block that bears on the bearing split face. Measurements are made by dial gages from the face of the block to the face of the joint. Parallelism of the split faces in reference to the bore axis is also checked.

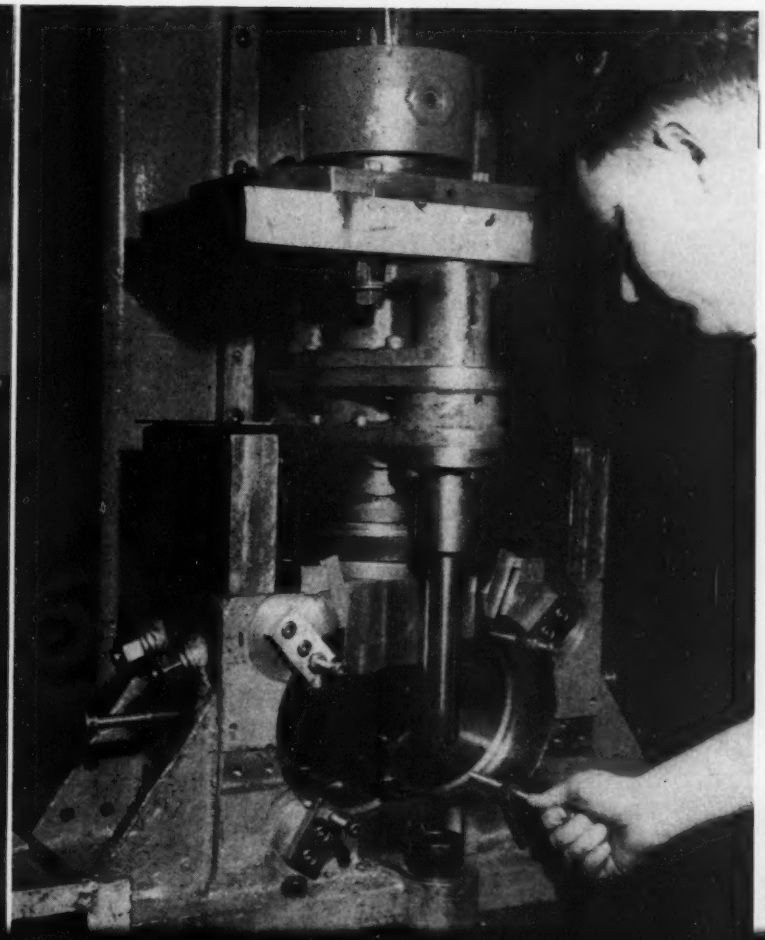
Final machining of the bearing bore is done in a precision boring machine using a single-point carbide tool for bronze surfaces. The surface produced in this bore must have a finish not exceeding 20 microinches, root mean square.

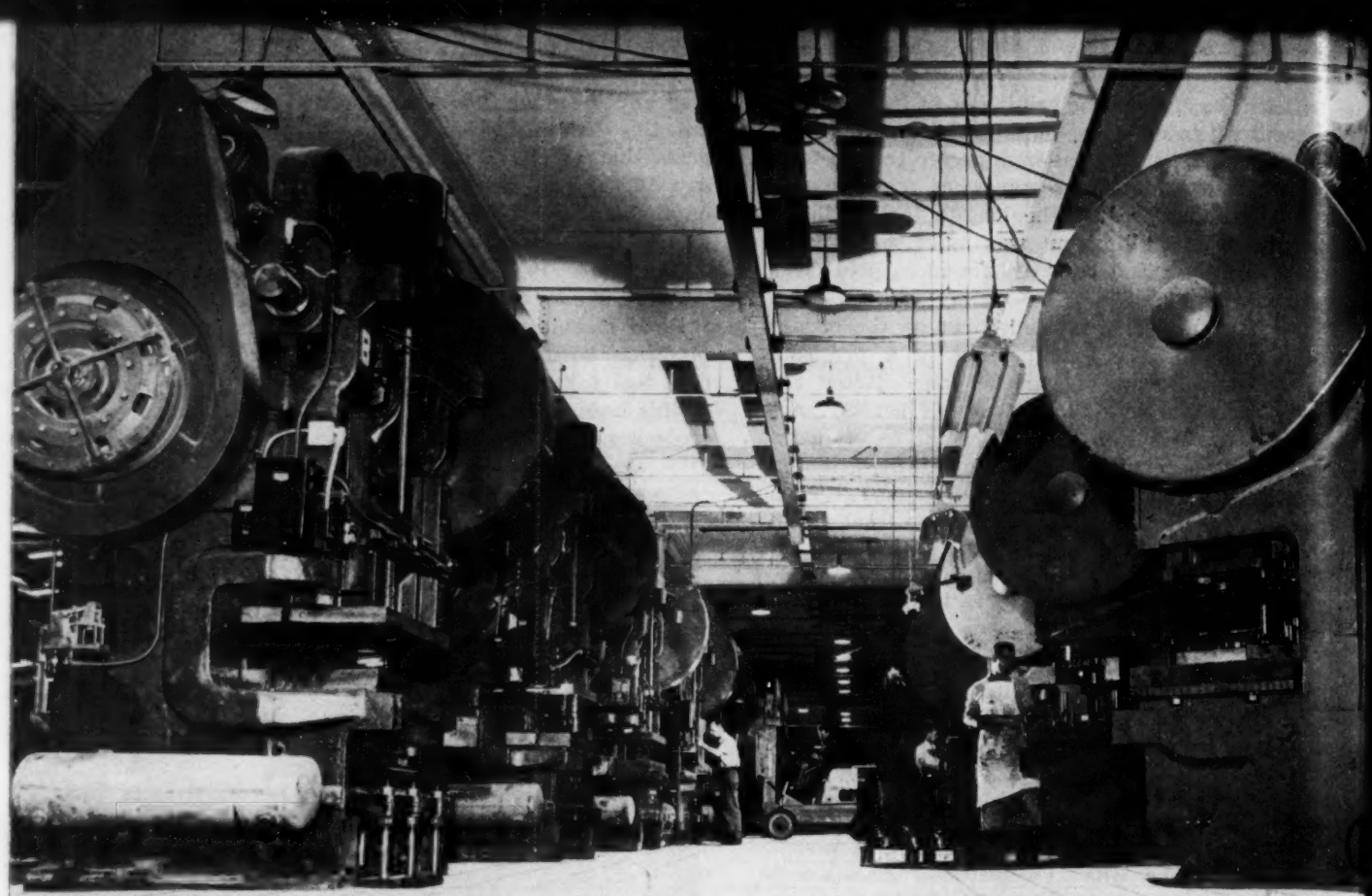
Fig. 3 *(right)—Press in which half bearing of bronze bonded to a steel sleeve is shaped to die contour under pressure sufficient to produce a fixed set. Later, split faces are machined to produce a perfect half bearing with semicylindrical diameters*

Fig. 4 *(below)—Special fixture in which half bearings are precisely gaged while clamped under maximum pressure for which bearing is designed against a half shell that is free to rock on needle bearings. Height is held within plus or minus* 0.0005*-inch or closer limits*

Fig 5 *(below right)—Hydraulic press with special fixture used to punch locking tang in side of a large diesel bearing*







MASS PRESS-FORMING

Figures Prominently in Steel House Production

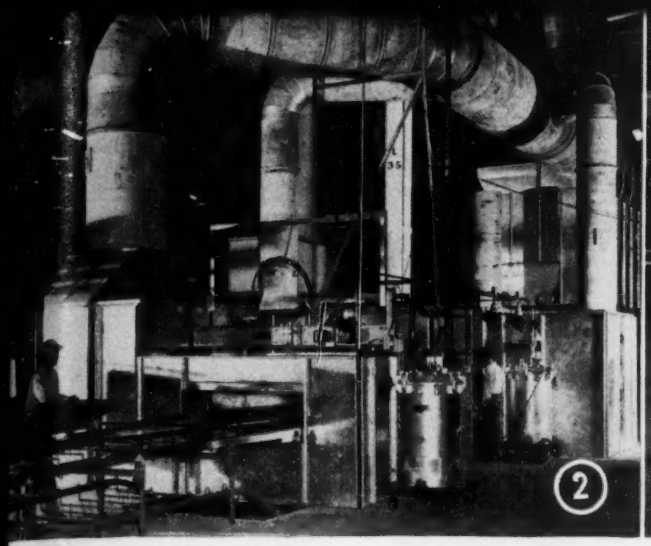
WHEN production facilities of Lustron Corp.'s main building—a total of 1,100,000 square feet—can be brought up to full schedule, the Columbus, O., steel home fabricating concern, will be able to turn out an estimated 30,000 homes per year or about 100 units per day. At that rate, it would mean some 1200 tons of 20 gage, SAE 1008 steel will be needed to make multiples of the 126 different section parts that go to make up a complete house. This does not take into account structural parts of heavier steel.

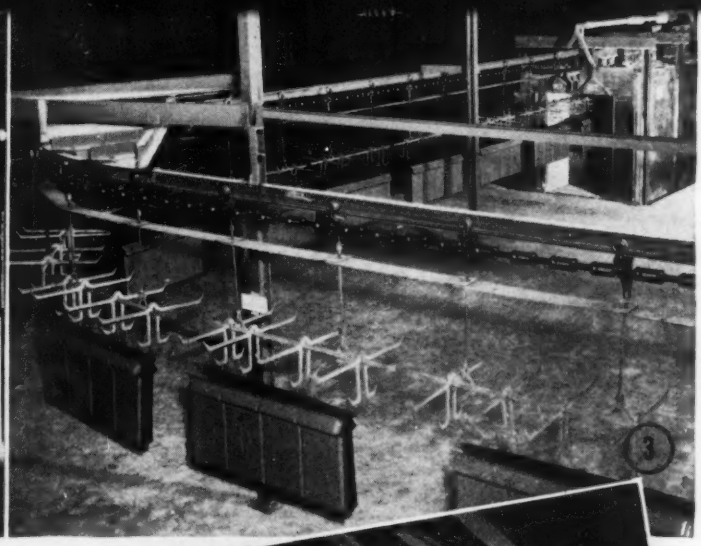
To mass-produce homes at this projected rate, the plant production sequence is laid out in a continuous line served by 9 miles of conveying equipment. Actually, however, production is divided into two main phases—forming of many required sections and porcelain enamel finishing.

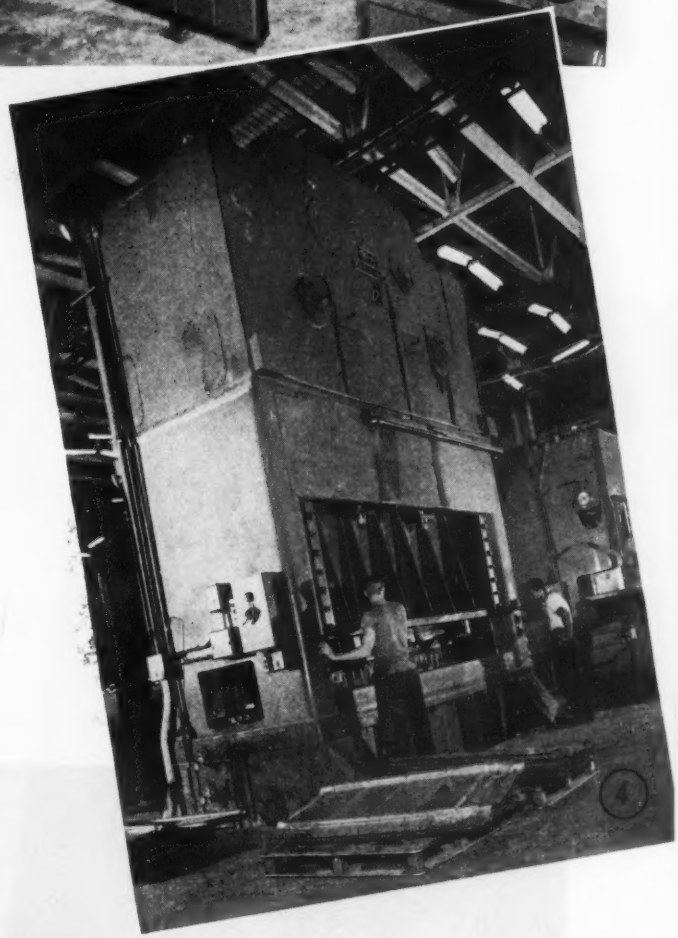
Battery of 163 Presses—Forming is done in a separate department where presses of various sizes are grouped together with other forming and welding equipment. Here, steel is received in either sheet or coil form in widths to meet requirements of the particular piece to be fabricated, and moved directly to the shears and presses. A battery of 163 presses, ranging in size from 15 to 1800 tons, is used to stamp out constituent components. All presses are semiautomatic and for many parts that require more than one press operation, the units are of the multistage progressive die type.

In fabricating the many 2 x 2-foot exterior panels, for example, one 4-stage press does a blanking, forming, crimping and piercing operation from a continuously fed strip of steel. Bath tubs are formed in five operations, one of them being the initial forming consisting of a single draw. Structural sections of the houses include many standard parts, principally formed sections and gussets. Coil steel stock is used and 8 to 12-station rolls shape the various sections. The structural parts are welded at five welding stations. Three of these are employed for joining wall sections and two for truss units.

Preparing the steel components for various finishes requires several operations. Structural members are







bonderized to protect them from corrosion. They then go through a flow-coat paint booth, and on to a gas-fired drying oven. Plant equipment to handle this work through bonderizing, painting and drying represents one of the largest installations of its kind in the country, handling work 17 feet in height and 8 feet in length. From the drier, the sections come out with a hard, bright black finish that meets all accelerated weathering tests.

Other formed parts, exterior and interior panels, cabinets and sanitary ware are cleaned by pickling. Process consists of hot emulsion cleaning, rinsing, hot alkaline cleaning, rinsing, hot sulphuric acid pickling, rinsing and hot nickel flashing in that order—followed by hot cyanide and borax neutralizing and hot air drying. Although common method of pickling is by the dip method, Lustron finds the spray method advantageous in this instance.

While all finishing equipment is in the same general plant area, certain driers and enameling furnaces are set up for the different finishes. Thirty-six ovens and furnaces located on conveyor lines are employed for the work. Two of these are electric and the remaining 34 are all gas units.

Ever since it was discovered that the inclusion of a heavier coat of nickel on the cleaned cold-rolled steel produced an excellent finish, application of porcelain enamel to exterior and interior panels has been a one-coat proposition. Most of the enameling is done by spraying, both hand and automatic or by employing a combination of the two. Base coats on exterior panels are applied by dipping or slushing, depending on the size of the part.

Enameled parts are processed through the firing furnaces at a temperature of 1300° F to prevent steel warpage. Because different parts requiring different enamels are segregated by respective conveyor lines, many similar drying ovens and firing furnaces are found in the plant. This enables the company to process different home components at one time so that a complete set of parts for one house comes off the lines at about the same time ready for "packaging."

Fig. 1—Sectional glimpse of press department showing double row of forming presses employed to process exterior and interior panels for the Lustron home. Battery of 163 presses shapes many parts required

Fig. 2—Following production-line application of enamel in automatic spray booths, parts proceed directly into furnaces such as this one for firing

Fig. 3—Exterior panels with finished ground coat emerging from a gas-fired furnace where, at 1300° F, the finish becomes porcelain enamel. Company employs six such units, each capable of handling 19,000 pounds of ware per hour

Fig. 4—Medium size 600-ton press here is used to form architectural parts such as exterior corners and roofing panels. Largest press in the department is an 1800-ton unit

Inspecting Forged Turbine Blades and Buckets

Quality control procedures necessary to meet extremely close tolerances involve the use of precision techniques from preparatory layout and engineering through final inspection

Fig. 1—Die templates for precision turbine forgings are carefully checked by ten times size images on a comparator

Fig. 2—Close inspection of the finished dies before release to the forge shop insures conformity to drawings and specifications

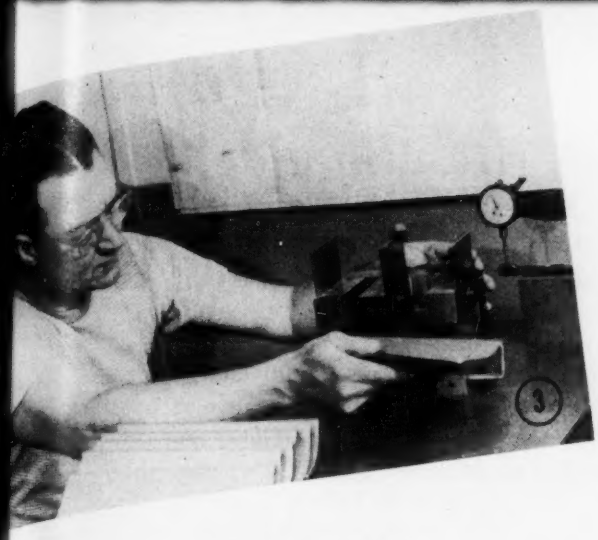
Fig. 3—Knives of the guillotine gages drop on critical sections of the turbine blade and indicate correctness of contour

BECAUSE of the close tolerances required and the commercial use of the forged part, inspection of precision forged turbine blades and buckets cannot be stressed too highly. Standard tolerance adopted by the Drop Forging Association for impression die forgings of comparable weight (4/10-pound) is plus 0.027-inch, minus 0.009-inch thick, and a shrinkage and die wear tolerance of plus or minus 0.015-inch. It has only been in recent years that the forging industry has even attempted to forge to the plus or minus 0.005-inch thickness tolerance that must be held in precision blade work.

Add to this a warp angle tolerance of plus or minus 30 minutes; a contour tolerance of plus or minus 0.0025-inch per blade surface; a bow or deflection tolerance of plus or minus 0.010-inch, and one has not only a forging problem that requires highly specialized techniques, but an inspection problem as well.

To insure quality control five major steps are used in the inspection procedure at Steel Improvement & Forge Co.: Preparatory layout and engineering, die inspection, forge inspection, hardness inspection and final inspection.

Preparatory Layout and Inspection—When each new order is received, it involves considerable work on the part of the inspection department to "get the ball rolling". First, ten times size (10X) master plates are made either on vinylite or glass plates for every blade section on the customer's blueprint. On some compressor blades currently used in Air Force fighters, this involves as many as 11 different sectional layouts. These sections are usually at regular intervals relative to the head, also referred to as the dovetail, root, anchor or butt. The plates require layout work of extreme accuracy as they are the master for all subsequent inspection. Second, standard master plates are also made at this time for use



By R. F. WAGNER
Chief Inspector
Steel Improvement & Forge Co.
Cleveland

in the Pant-O-Scriber. Guillotine gages, inspection templates and special blade holding fixtures are designed to facilitate rapid and accurate inspection.

Die Inspection—Before a die sinker may proceed with the sinking of an impression, all working templates must be passed by inspection. The templates are checked for squareness; for accuracy of contour against the master plate on the comparator; for a constant center-line distance to the "matched edge," or left side of the template; and for the relation of depth of contour to the working faces of the die usually referred to as the "locks." These templates are held to 0.0005-inch accuracy, or they are subject to rejection. If satisfactory, they are stamped by the inspection department's seal of approval. The exhaustive checking of templates is necessary to eliminate costly errors and unnecessary delay in the fulfillment of the delivery promise.

When the dies are completed, not only is the finish impression checked to see that it conforms to the customer's requirements, but the preliminary impressions are also checked to see that they conform to the forging and engineering development drawings. The dies, usually small inserts, are brought to the inspection department and given a surface plate layout. Here all necessary equipment such as height gages, gage blocks, vernier protractors, sine-bars, etc., are available. The inspection department assumes all responsibility in assuring the forge shop that the dies furnished them are of such accuracy as to make it possible for them to meet customer specifications.

Forge Inspection—The initial inspection of a forged blade is made directly at the hammers. Here such problems as line-up, surface conditions and visible flaws are controlled. If the forging indicates that the two halves of the die are not in their proper relation, instruction is given to the hammerman by the hot inspector as to the amount and direction necessary to move his dies to correct this condition. If the surface condition is poor, the inspector calls for a recheck of the furnace temperature and atmosphere controls.

The first forging to pass the hot inspector is submitted to the inspection department for complete dimensional analysis. This includes a check of the airfoil sections and their relation to each other on the Pant-O-Scriber. The Pant-O-Scriber is specially designed for checking the airfoil section of a blade or bucket in a nondestructive manner. It consists of two tracing arms with ½-inch Carboloy tracing rollers that follow the contours of a given section of a blade held upright in a specially-designed holding fixture. At the other end of the arms are two individually driven-scribing heads that scribe ½-inch spiral circles on coated glass. One arm is for the concave side of the blade section and the other is for convex side. This produces an image on the glass which is an exact duplicate of the section traced.

The glass plate is then superimposed over a master reticle of the desired contour and the two are placed in delineascope. The operator views the enlargement projected against a screen and determines the acceptibility of the blade. Where a discrepancy exists between the two contours, built-in micrometers are used to move the master reticle in line with the scribed profile so the amount of error can be noted. The delineascope is provided with an accurate angular vernier which also enables the operator to measure any twist or warp angle discrepancy.

After a thickness check, the sample is subjected to Magnaflux inspection, a nondestructive method of detecting concealed flaws which may have been overlooked by the forge inspector. Other blades are checked periodically during the forging run.

Hardness Inspection—The varied shapes of thin, small areas of turbine blades present difficulties in obtaining smoothly ground parallel surfaces for Rockwell testing. Special techniques of grinding were developed to overcome these problems. Acceptable hardness ranges, approaching the limits of machinability, are narrow, the heat treating must be carefully controlled to avoid rejections. All turbine blades are given a 100 per cent Rockwell check to insure forgings to the customer's hardness specifications.

Final Inspection—All forgings go through final inspection where they are stamped to indicate the mill heat number, customer's part number, and the date before being released to the shipping department. This inspection consists of an exacting visual inspection for pits, unfilled areas or other flaws. Visual inspection is followed by Magnaflux or zyglo inspection to insure quality and soundness.

Dimensional, straightness, contour and warp angle checks follow in order. These are made by the use of guillotine gages and quick-reading dial indicators. A guillotine gage is a box type fixture that holds a blade so that the center of gravity is true relative to the sides or ends of the fixture. A series of section templates or knife blades (hence the term guillotine) are brought against the contours of the blade at the designated sections, both front and back. The edges of the knives that come in contact with the blade are a reproduction of the contours for that section taken from the master plates.

In checking the blade for accuracy, any error between blade and template is checked by the use of round feeler gages. The position of the templates, relative to the fixture, indicates any discrepancy in warp angle and bow. Whenever a blade or bucket does not come up to the particular standard set for it, or is out of tolerance it is rejected.

FUNDAMENTALS of STEELMAKING

NUMBER 14 OF SERIES

Another in a continuing series of articles on the making of steel and finishing it into products ready for the consumer. Each article is written by an outstanding authority in his particular field.

Production of

Seamless Steel Pipe and Tubes

In this second part, the author continues his discussion of the seamless tube rolling process as used today. The new continuous tube rolling mill now being installed by National Tube Co. is described in detail

By BRYANT BANNISTER
Consulting Engineer
National Tube Co.
Pittsburgh

PART II

REFERRING to Fig. 9, it will be noted that the three principal elements of the expanding mill are, as in the piercers, the rolls, plug and guide shoes. Rolls are of the disk type mounted on driven spindles at a wide angle to the mill axis or pass line. The axes of these spindles lie in planes parallel to each other and to a horizontal plane through the mill axis, one axis lying above and one below the mill axis. While not apparent in the figure, this arrangement provides a feeding effect to the shell being expanded and is equivalent to the skewed axis arrangement employed in piercing mills. Working faces of the disks are at such an angle to the plug profile that the shell in traversing the pass has its wall thickness reduced. In theory, the wall is reduced at a rate sufficient to provide for the expansion of the shell on the basis of no shell elongation. However, to compensate for variation in wall thickness of the entering shell, profiles are such that over-expansion would result if not limited by the guide shoes which force excess circumferential growth into length.

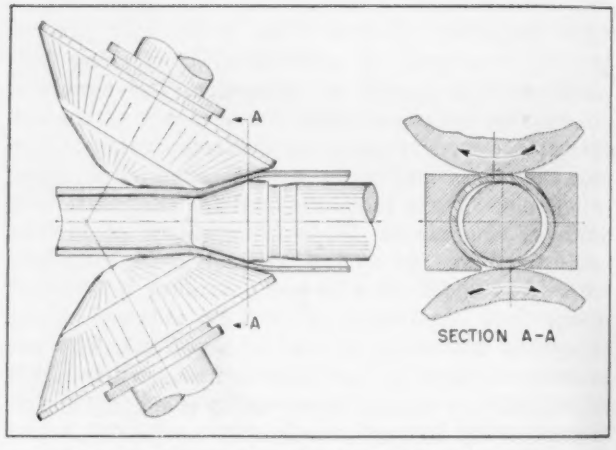


Fig. 9—Description of rotary rolling operation

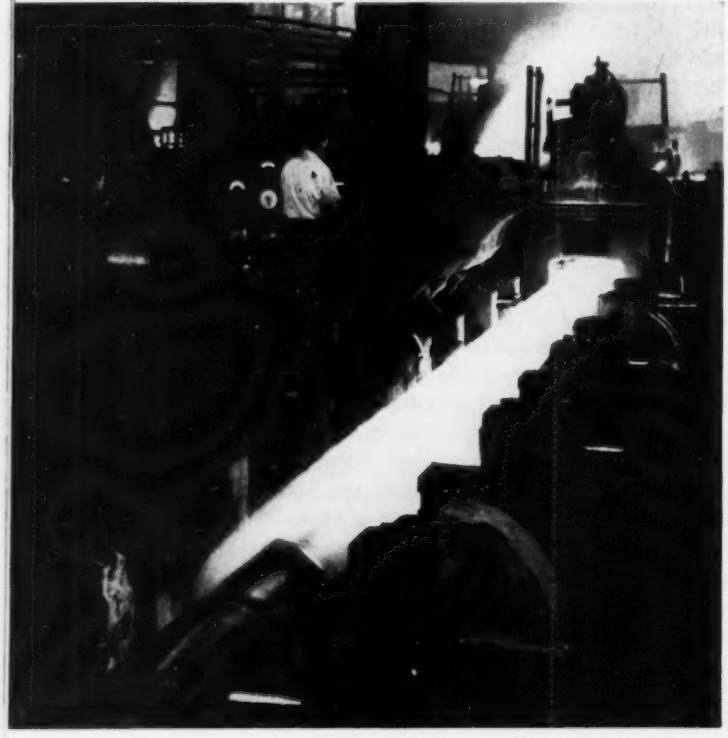


Fig. 10—View of 26-inch OD pipe emerging from the rotary rolling mill

In expanding, it is desirable to avoid twisting of the shell. This is accomplished by giving the disks substantially the same rate of expansion as the shell. This proportioning tends to cause each revolution of the disks to produce the same number of revolutions of the shell at any section of the expanding cone. The action is similar to that between the two elements of a bevel gear and pinion combination. Fig. 10 shows a pipe emerging from a rotary rolling mill.

From the expanding mill, pipe is conveyed to and through the reelers as previously described.

After reeling, all pipe produced by the process herein described is passed through a tunnel-type furnace (see Fig. 11 which shows a pipe about to enter such

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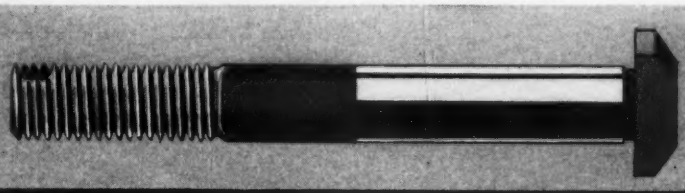

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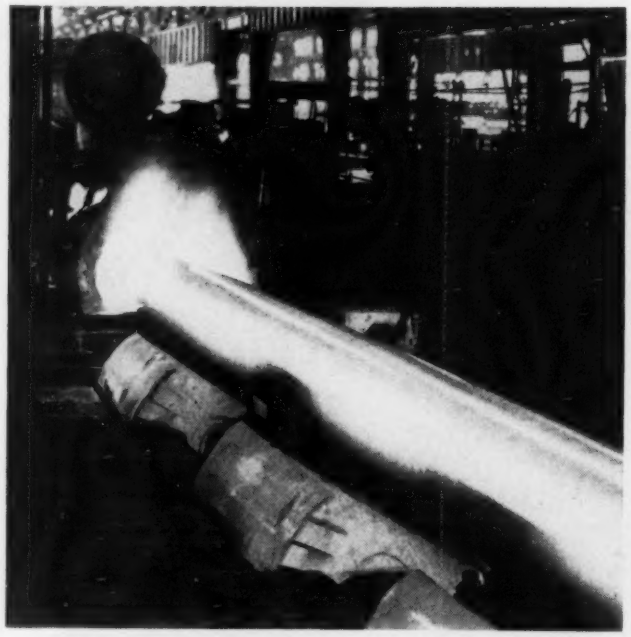


Fig. 11—Pipe after reeling is seen about to enter a tunnel-type furnace prior to delivery to a sizing mill

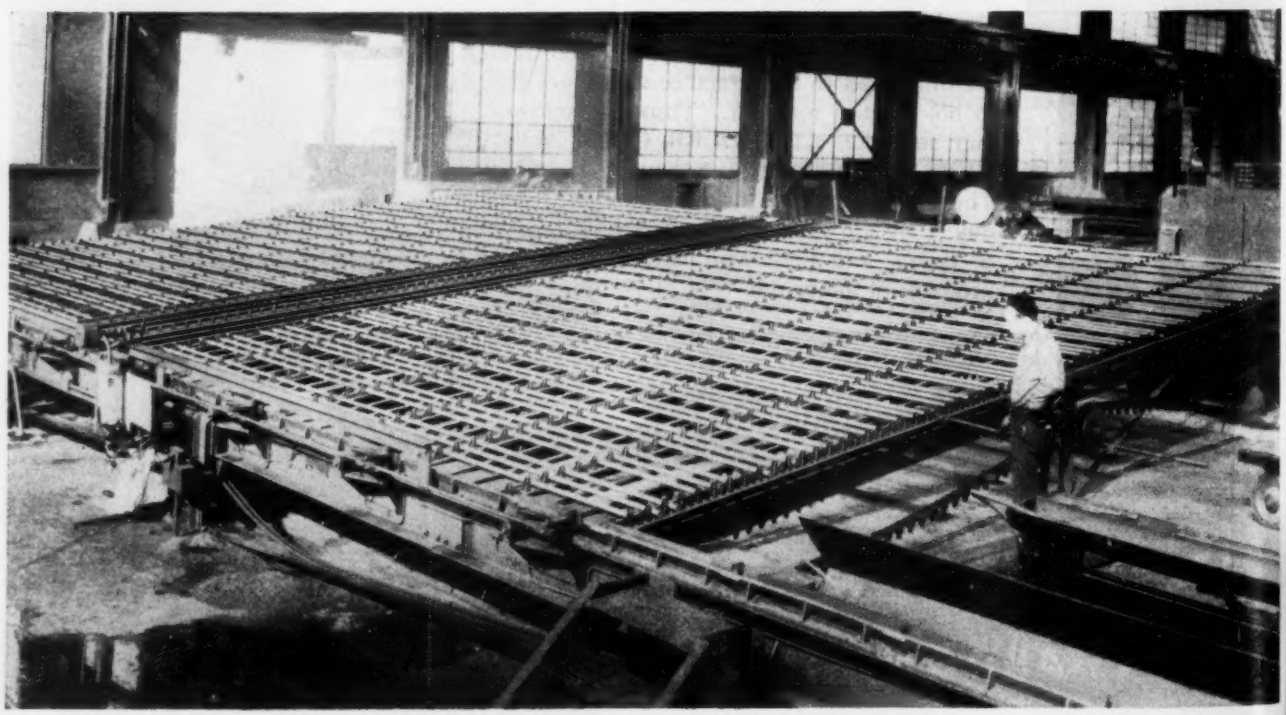
a furnace) to a sizing mill. In the case of larger pipe, such a mill generally consists of three or more stands of driven rolls, two rolls to a stand and each provided with a semicircular groove, the two forming a circular opening through which the pipe must pass. The first groove is slightly (approximately 3 per cent of pipe diameter) smaller than the reeled pipe. The following stands are correspondingly grooved, with the last two being the same diameter to assure roundness and proper size. Alternate stands are mounted with the roll axes at 90 degrees to each other. Since pipe is at an elevated temperature during sizing (approximately 1850 to 1900° F), allowance is made for shrinkage in cooling. From the sizing mill, pipe is rotated slowly over a cooling table until it reaches approximate room temperature.

For smaller pipe, and especially sizes under 8⅝ inches in diameter, the number of stands may range from 5 to 16. There is no physical reason why more stands cannot be employed if greater diameter reductions are desired. When the number exceeds 7, it is good practice to drive each stand with an individual adjustable-speed motor, whereas in larger mills of fewer stands, where the operation is merely one of sizing, all stands may be group-driven by a single constant speed motor.

In discussion of the various phases of seamless tube manufacture, the role of each unit has been described. It was also previously indicated that the number of operations is dependent on size of tube being produced. To further clarify these discussions, the following examples, which typify the variations employed in the manufacture of seamless tubes are given to develop operations step by step.

In producing a 2⅜-inch OD by 0.154-inch single length hot-rolled tube, a solid billet 3¼ inches in diameter and weighing approximately 82 pounds is pierced to a shell 3-7/16 inches with a 0.215-inch wall, about 11 feet long. This pierced shell is passed, without reheating, to a plug rolling mill where it is plug rolled in a 3¼-inch groove to produce a 3¼-inch OD tube with a 0.140-inch wall and 17 feet 6 inches long. The plug-rolled shell is then reeled to approximately 3-7/16 inches OD, 0.140-inch wall, and about 16 feet 6 inches in length. After reeling, the tube is passed through a reheating furnace and into a reducing sizing mill from which it emerges 2⅜ inches OD with a 0.154-inch wall and about 22 feet 3 inches long.

Fig. 12—Conventional-type pipe cooling table which receives pipe after sizing



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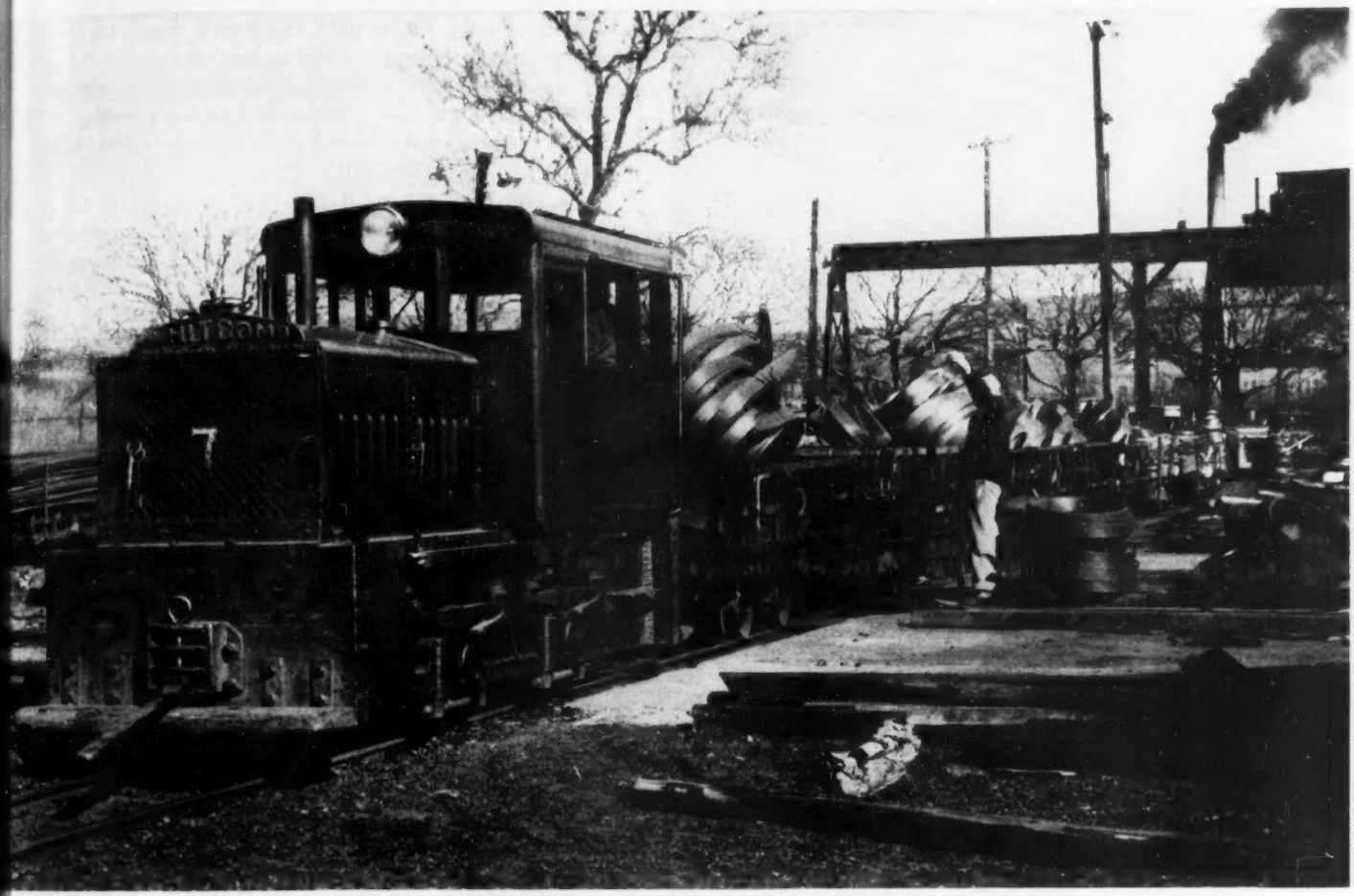

WHITCOMB 10-ton Diesel Locomotive spotting cars of strip alloy steel under a crane at an eastern steel plant. This is one of the first of eleven Whitcomb Industrial Diesels put into operation by this steel plant since 1917.

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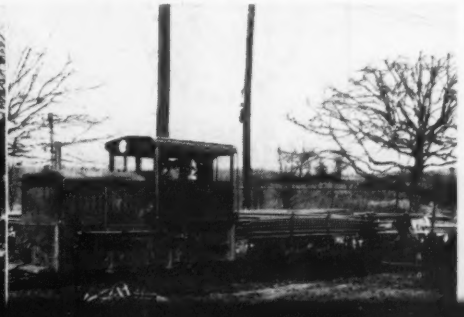


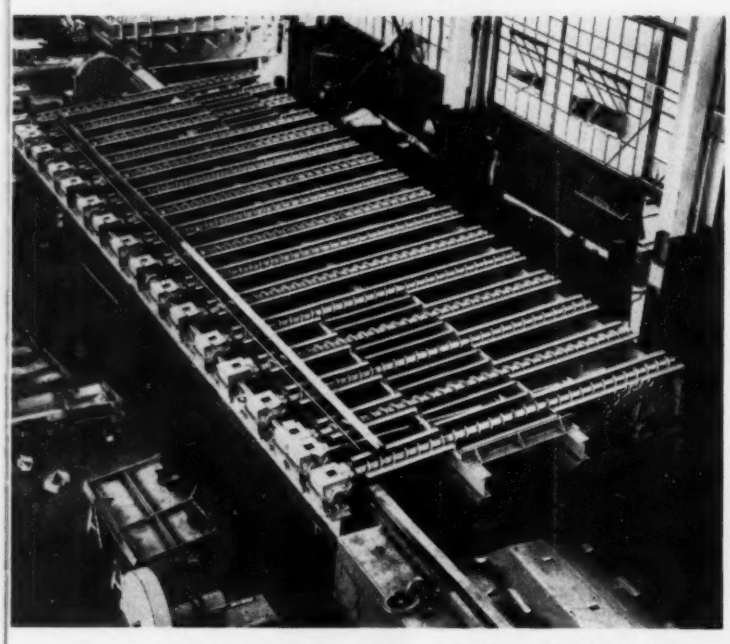


Fig. 13—Screw-type pipe cooling table which was recently developed is particularly applicable to the handling of small diameter pipe

In producing a double length hot-rolled tube 8⅝ inches OD with a 0.277-inch wall, a solid billet 8¼ inches in diameter, 6 feet 4 inches long, weighing 1166 pounds is pierced in the first piercer to a shell 8 inches OD, wall thickness of 1¼ inches and 12 feet 10 inches long. Without reheating, this shell is further processed in the second piercer to a shell 8⅝ inches OD with a 0.470-inch wall, and approximately 28 feet long. The shell from the second piercer, after reheating, is plug rolled in an 8-7/16-inch groove to 8-7/16 inches OD, 0.277-inch wall and 46 feet 9 inches long. The plug rolled tube is transferred directly to the reeling machine which produces a tube of 8¾ inches OD, 0.277-inch wall, and 45 feet 5 inches long. The tube then receives two or more passes in a two-high sizing mill from which it emerges 8⅝ inches OD with a 0.277-inch wall and approximately 46 feet long.

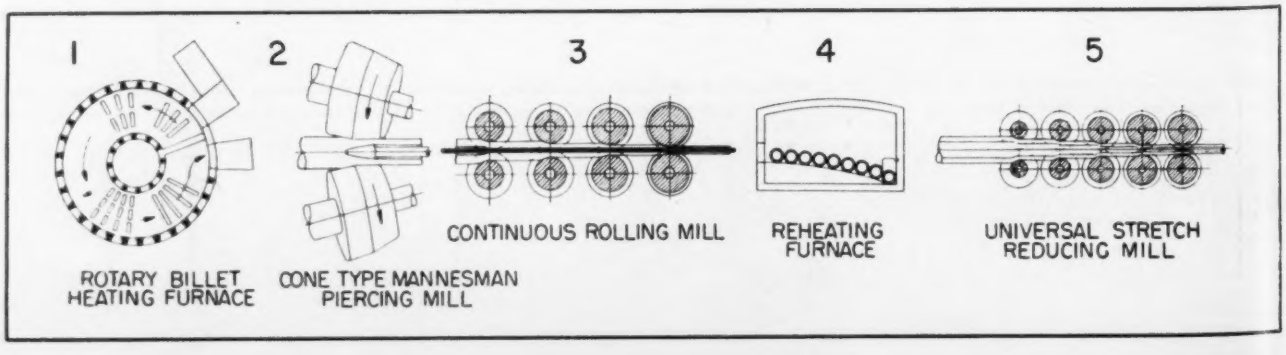
To produce a 26-inch OD, 0.303-inch wall double length hot-rolled tube, a solid billet 12¼ inches in diameter, 10 feet long and weighing 4007 pounds is pierced to a shell of 14 inches OD, 1.640-inch wall, and 18 feet 3 inches long in the first piercer. This shell, in the same heat, is entered in the second piercer where it is rolled to 17 inches OD, 0.750-inch wall and 30 feet 2 inches long. After reheating, the shell is plug rolled to form a tube of 16¾ inches OD, 0.500-inch wall, and 44 feet 9 inches long. The plug-rolled shell is reheated a second time, after which it is rotary rolled to 26¼ inches OD, 0.303-inch wall, and 45 feet 8 inches long. Without reheating, it is then reeled to 26½ inches OD, 0.303-inch wall, 45 feet 3 inches long. The tube after reeling, is again reheated in the tunnel-type reheating furnace, after which it passes through two stands of two-high sizing mill rolls, forming a hot-rolled tube 26 inches OD, 0.303-inch wall, and 46 feet long.

In the case of small pipe and tubing, up to approximately 4½ inches OD, the possibilities presented by the proper application of the stretch reducing mill are very substantial indeed. In any seamless operation employing cross rolling, as in the piercing mill, rate of linear production is quite limited. This is true regardless of product size. Consequently, the rate of production measured by weight increases with the product diameter and wall thickness. It follows logically, therefore, that any step in the process which, for a given product, increases size of the pierced and rolled shell will increase output of the mill provided suitable means are used to reduce the oversize shell to the desired pipe size. The multi-stand adjustable speed stretch mill is a very efficient unit to perform this latter operation.

A stretch reducing mill consists of a series of pairs of rolls, mounted in housings and spaced as close to one another as design considerations will permit. Each consecutive pair of rolls is driven at a speed in excess of that required to deliver an equal volume of metal per unit of time from each roll stand. Tension is thereby developed in the tube between stands. Much greater diameter reductions can be attained with tension than can be obtained in conventional rolling. Without tension, reductions in diameter of about 3 per cent are common, while with tension, these diameter reductions can be as high as 10 per cent. Rolling in tension also permits tube wall reduction simultaneous with reduction in diameter. This is impossible with conventional sizing in which diameter reductions result in an increase of the wall thickness.

A conventional cooling table that receives pipe after sizing consists of rails laid parallel to each other and on which the pipe is caused to roll in the direction the rails are laid. Motivating force is supplied by driven endless-chains supported parallel to

Fig. 14—Modern continuous seamless pipe and tube mill capable of rolling ½ to 6-inch OD pipe



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STRONGER, LONGER-LASTING,
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J&L STEEL PERMA-TUBE
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The vertical mast and cross-arms of the Ward "Minute Man" antenna are made of J&L PERMA-TUBE. It takes just 60 seconds to remove the preassembled antenna from its box and swing all arms into position as shown here. PERMA-TUBE antennas combine strength, rigidity and rust-resistance—give longer *trouble-free* service—and better television reception.

PERMA-TUBE may be used for many applications where strength, rigidity, rust-resistance, and attractive appearance are necessary.

By using the new exclusive rust-resisting J&L PERMA-TUBE for the vertical mast and cross-arms in the "Minute-Man" series of television antennas, Ward Products Corporation, Division of the Gabriel Company, Cleveland, Ohio, builds-in the following advantages:

1. **Greater structural rigidity with smooth, attractive appearance. Greater strength to resist ice loads.**
2. **Clearer, steadier, television reception. Less vibration from wind.**
3. **No mechanical seam in Perma-tube to invite rust which would reduce the torsional strength.**
4. **Ease and speed of installation . . . at less cost.**

J&L PERMA-TUBE is a light-wall, electricweld steel tubing, coated inside and out with an exclusive plastic-type, weather-resistant finish. PERMA-TUBE can be furnished: bent . . . expanded . . . flanged . . . swaged or fluted.

J&L PERMA-TUBE for television antennas, *costs less than any other tubing with comparable strength, rigidity and rust-resistance.*

J&L PERMA-TUBE is not only applicable to television antennas, but also wherever strength, rigidity and rust-resistance are important. It is available in all regular sizes and shapes of J&L Electricweld Tubing and in lengths up to 10 feet. Return the coupon TODAY for complete information on this new J&L product.

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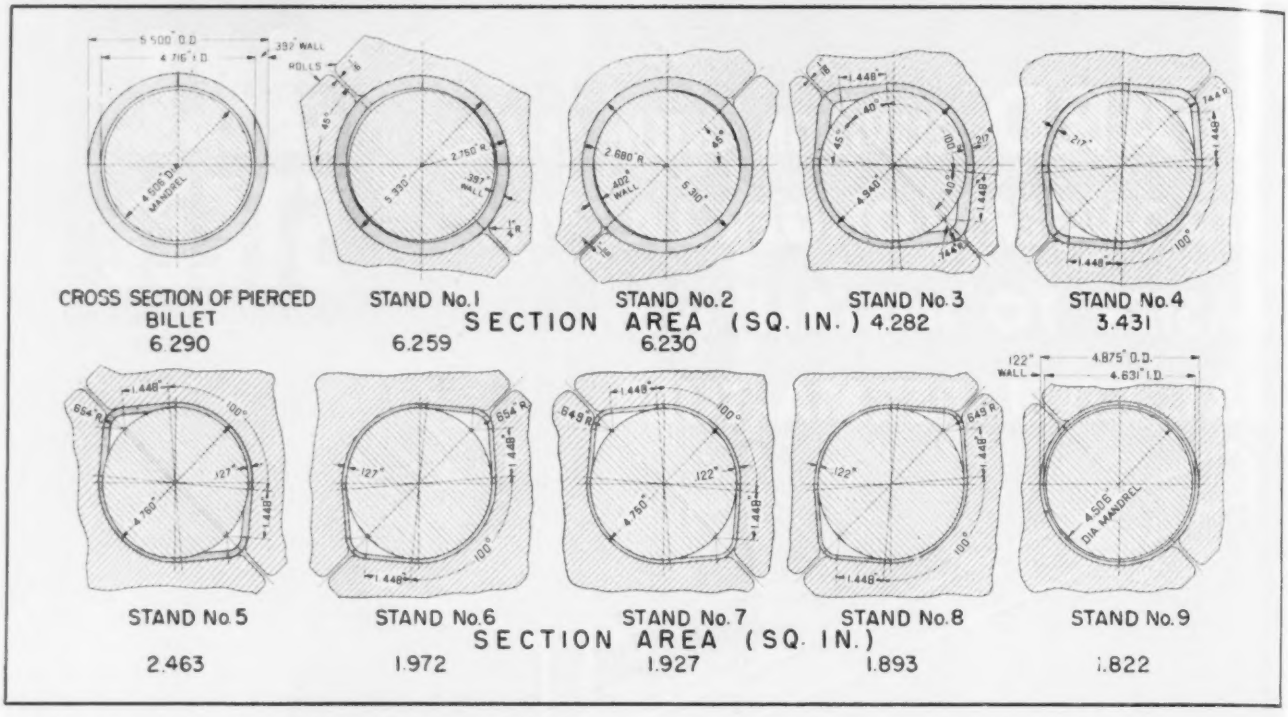

Fig. 15—Pass design for a nine-stand continuous tube mill when rolling 4.875-inch OD by 0.122-inch wall pipe

and just below the upper surface of the rails. The chains at the top and bottom of the table reverse direction on sprockets. Paddle-like fingers carried by the chains project above the rail surfaces and push the pipe forward causing it to roll. The paddles are in alignment across the table, thus keeping the pipe in a straight line. Fig. 12 illustrates such a cooling table.

Recently, a cooling table of quite different construction has been developed. This table, which may well be classed as the "screw" type, is particularly applicable to the handling of small diameter pipe. Rails are present as in the conventional type table but in place of chains the actuating mechanism consists of pipe around which are wound rectangular steel bars in a helical direction, forming a huge auger-like screw. These screws are disposed parallel to and between the rails and power rotated, causing the pipe which rests against the helical members to rotate and advance across the table. One-half of the screws are left handed and one-half right handed and are rotated in opposite directions. This construction tends to prevent pipe from moving either to the right or left as it progresses across the table. With this type cooling table, it is a simple matter to speed up either side of the table by slightly enlarging the pipe core of the screw. The pipe will then travel endwise in the direction of rotation of the enlarged section. This construction can be utilized to move the pipe first to one side against a stop where a crop can be cut by a saw and then a little farther along the table in the opposite direction for cropping the other end. Fig. 13 is a good example of a screw-type table.

After cooling, seamless pipe, whether large or small, is ready for various finishing operations which include straightening, if necessary, inspection, cutting-off, testing, threading, marking, coating, etc.

It is not the purpose of this discussion to deal with the many finishing operations to which pipe may be subjected. An effort has been made to outline principal operations employed today in this country in the manufacture of practically all seamless pipe. Certain modifications of standard practice in pipe manufacture, however, have reached the construction stage, while others have only been explored on paper with some experimental background.

One of the most interesting and potentially valuable contributions to the art of making seamless pipe is the so-called "continuous-tube rolling mill". Essentially, the tube rolling mill is similar to a modern strip mill in that the tube passes progressively from stand to stand, each stand effecting a reduction in wall thickness. This mill has had a considerable background of experience in Europe and to some extent in this country, but nowhere on as substantial a scale as one now being constructed by National Tube Co. This mill is designed to deliver pipe 65 feet long in sizes from 2 to 4½ inches OD at rates up to 900 feet per minute out of the last stand of rolls. After further processing in a stretch reducing mill lengths up to 400 feet and delivery rates as high as 2200 feet per minute will be attained.

The above mill consists of nine individually powered stands in tandem of two-high grooved rolls. Rolls in consecutive stands have their axes at 90 degrees with each other, each stand being set 45 degrees to the horizontal. Motors driving these roll stands aggregate 8500 horsepower, and all are of the adjustable-speed type. An internal cylindrical bar or mandrel against which the pierced billet or workpiece is rolled is required. This mandrel, which is considerably longer than the workpiece, is telescoped

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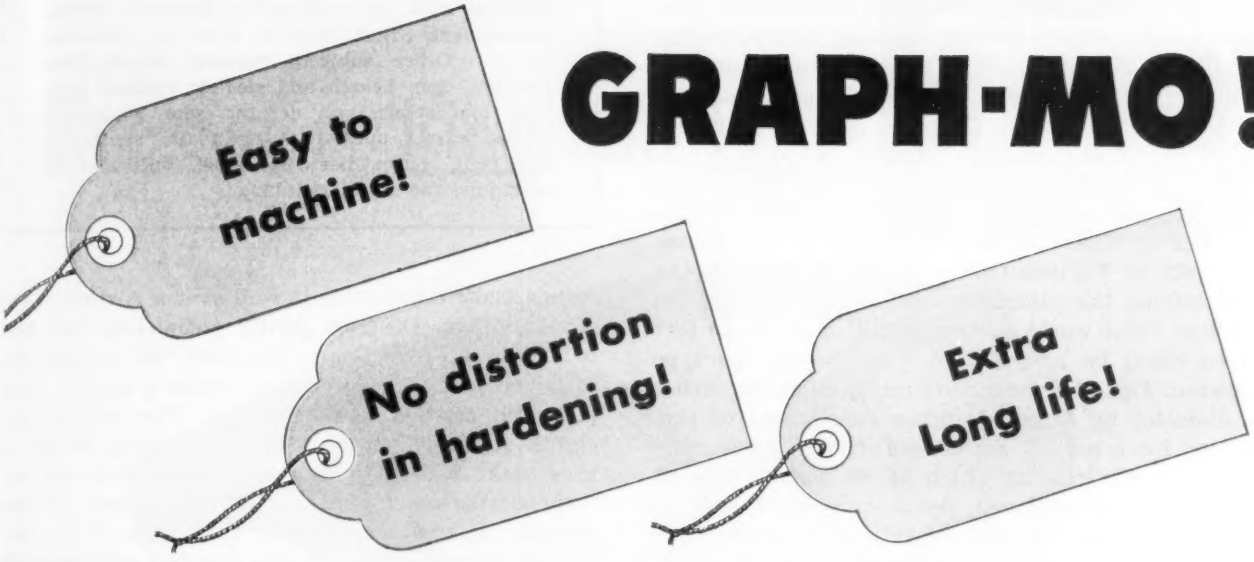

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Timken Graph-Mo is a general purpose oil-hardening tool steel. Because of the free graphite in its structure, it machines fast and easily. Surfaces may be finished to precision tolerances. Graph-Mo has good anti-frictional properties and a unique ability to retain lubricants. It has minimum tendency to scuff, seize or score. Due to uniform response to heat treatment, distortion in hardening is minimized. It has excellent stability. And because Graph-Mo contains diamond-hard carbides, it offers stubborn resistance to wear.

Graph-Mo is one of four Timken graphitic steels that have now gained wide acceptance in industry for use in dies, gages, machine parts and many other applications. For the latest information on these exceptional steels, write for the new, enlarged 9th edition of the Timken Graphitic Steel Data Book. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

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through the workpiece immediately before it enters the mill and passes with the workpiece through the mill during rolling.

Fig. 14 illustrates the operational sequence where a rotating-hearth billet heating furnace and reducing-type piercing mill are employed ahead of the continuous mill with a stretch reducing mill following it. In this diagram, rolls in both the continuous and reducing mills are shown in a common plane for ease of illustration; actually alternate rolls are in planes 90 degrees apart as stated earlier.

Fig. 15 is presented to illustrate a typical continuous mill pass setup wherein a pierced billet of 5½-inch OD by 0.392-inch wall is reduced in nine stands to a tube of 4⅞-inch OD by 0.122-inch wall. If the tube leaving the continuous mill is 65 feet long, the entering billet would have a length of about 19 feet which could be produced in a piercer of the type shown in Fig. 14 from a solid round billet 5¾ inches in diameter by 4 feet, 7 inches long. Rate of production for a mill of the described type is generally limited to the rate at which billets can be pierced. With a high speed piercer, the above product could be processed at the rate of four tubes per minute. This represents an output of 48 tons per hour. To illustrate the tremendous production possibilities of a well balanced mill, including the stretch-reducing unit receiving the above tube and converting it into ½-inch standard pipe, the above production rate is equivalent to about 21 miles of pipe per hour. Of course, actual production would fall below this rate due to mill delays, etc.

The first two stands of the continuous tube mill reduce diameter of the workpiece until its inner surface is in substantial contact with the mandrel. In future mills, it is quite possible that these two stands can be eliminated by precise control of the inside diameter of the pierced billet. Each of the next two stands make a reduction in wall over a portion of the circumference, the two jointly completing the first increment of reduction. The next two stands, the fifth and sixth in this layout, make a similar complete but smaller wall reduction. The seventh and eighth stands might be termed planishing stands as they make a very light reduction and iron out any residual ribs which may carry through from previous stands. It will be observed that each of the roll grooves is concentric with the mandrel over only 100 degrees of arc, the remainder of the groove being flared away from the mandrel. This contouring allows the workpiece to assume an oval shape with substantial clearance from the mandrel at diametrically opposite areas. The ninth stand is provided with a circular groove to round up the tube, freeing it from contact with the mandrel. The tube and mandrel are then kicked out of the pass line and the mandrel is withdrawn by a stripper mechanism. The mandrel, of which there are several in the circuit, is then cooled, oiled, and returned to the entry side of the mill. The tube, after reheating, proceeds to the stretch reducing mill for further processing.

REPRINTS AVAILABLE

REPRINTS of this article in the series "Fundamentals of Steelmaking" and others published over the past few months may be obtained at nominal cost by addressing Readers' Service Department, STEEL, 1213 W. Third St., Cleveland 13, O. Other subjects covered include blast furnace, open hearth and electric furnace practice, tool steels, roll design, coke production, plates, sheets and strip, tin plate, structurals and rails, scrap, bessemer steel, butt and lap weld pipe and seamless tubing.

Filter Improves Cleanliness

GREATER efficiency and cleanliness are assured in the Cleveland plant of Taylor-Boggis Foundry Co. with a recently installed dust filter unit. In a new building for the machining of ferrous castings, one of the production lines is arranged for the dustless grinding and buffing of small cast iron castings. The two double wheel grinders and one double spindle buffer are hooded and ventilated to a dust filter mounted outside the building, this unit produced by W. W. Sly Mfg. Co., of Cleveland.

An exhaust fan and drive mounted on top of the dust filter casing creates suction at the machine hoods which draws the dust and metal particles through the piping and into the filter. The air borne material is retained on the cloth filter bags, allowing only clean air to pass through to the atmosphere, the company states.

Filter casing is fitted at the bottom with a hopper into which the dust falls when the filter bags are agitated by a shaking device, automatically operated when the exhaust fan is stopped. Another production line of two automatic screw machines, a double spindle drilling machine and a hand milling machine are ventilated and kept dust-free by a dust filter installed inside the building.

Test Demonstrations at Expo

TWIST, heat and quench tests to demonstrate bond permanence and tests to show uniformity of cladding thickness will be performed on clad steels made by Lukens Steel Co., Coatesville, Pa., at the 22nd Exposition of Chemical Industries, New York, November 28 to December 3. Simplicity of clad steel plate polishing will be demonstrated and a display panel will depict the welding sequence for such steels.

Displays will include examples of flame-cut, sheared, bent, pressed and blanked parts produced by By-Products Steel Co. division of Lukens and also a jacketed steel drier roll and labyrinth steam platen, the latter developed by Lukenweld Division.

Nickel Alloy Resists Corrosion

GOOD machinability, higher resistance to corrosion and freedom from any tendency to seize or gall when used in moving contact with itself or other metals, including the stainless steels, are properties of a new nickel alloy announced by Waukesha Foundry Co., Waukesha, Wis. Said to contain no copper and to be free of iron, the metal is available in cast form only and is designated as Waukesha Metal alloy No. 23.

Alloy does not require heat treatment and in the as-cast condition has a tensile strength of 50,000 to 60,000 psi, and an elongation of 7 to 10 per cent and a brinell hardness of 145-165 at 3000 kg load.

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Workers like the DOME METAL SIDE SCREENS that both protect and provide cooler ventilation . . . the individually molded, non-reflecting eyecups . . . the wide view of the work. Formfit chain bridge, large lens ring, one-piece rubber headband. 50 mm 6 Curve Super Armorplate lenses, clear or Calobar in medium, dark or extra dark shades. Your nearest AO Branch can supply you.

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Intensified STEEL INDUSTRY RESEARCH To Pay Off

Expanded technological activities in various phases of operations, revealed at first of AISI regional meetings, to be reflected in improved products

STEEL industry is engaged in more study and research work than ever before and many of the projects will lead to new and improved products. This fact was emphasized in Chicago, when the American Iron and Steel Institute conducted the first of a series of five regional technical meetings.

A similar meeting was held in Youngstown, O., Oct. 13, and other similar meetings of the institute are scheduled for Birmingham, Ala., Oct. 26; New York, Nov. 2; and San Francisco, Nov. 10. The series was originally planned to embrace six meetings with the initial one in Buffalo, Sept. 29, however, it was necessary to cancel this gathering because of the then impending steel strike.

Purpose of the meetings is to report to steel industry executives and technologists on progress being made in 40 technical and scientific projects which will help accelerate advancement of steel and benefit American industrial economy. The 300 who attended the Chicago meeting heard speakers tell how metallurgy is probing new fields, how efficiency of plants, processes and equipment is being improved and how new opportunities for use of steel are being developed.

Four Standard Addresses—Morning sessions for all five meetings embrace three addresses: "Comments About the Steel Industry," by Walter S. Tower, institute president; "How To Use Institute Facilities," by George S. Rose, institute secretary; and "Institute Research Projects," by C. M. Parker, institute metallurgical engineer. One of four afternoon technical papers, "Observations on Corrosion of Ferrous Metals," by G. D. Lain, research engineer of the institute, is also common to all regional meetings. Three additional papers vary city by city.

H. W. Johnson, vice president in charge of steel manufacturing, Inland Steel Co., Chicago, presided at the Chicago morning session, and J. Hart Reece, chief metallurgist, Colorado Fuel & Iron Corp., Pueblo, Colo., at the afternoon session.

Mr. Tower focused his remarks on the growth of the steel industry in the past decade and the growing importance of the Chicago area. Mr. Rose outlined activities of the institute, mentioning specifically that about a dozen divisions are engaged in a wide variety of activities, and their studies, reports and statistics are available to members of the institute and the public.

Many Research Projects—From tin can materials to railroad equipment, there is much of significance in research projects being conducted by the steel industry, said Mr. Parker. The future will see better protective coatings for steel, improved pipe, new structural uses for light-gage steel, use of substitutes for imported palm oil in making tin plate, better wheels and axles for railroad cars, and scores of other contributions to the general advancement of American life, the speaker predicted.

At the same time, he continued, steel is confronted with problems created by the gradual deterioration of the quality of some of its raw materials. Much research is aimed at overcoming these problems, which pertain to coal and coke, iron ore and other materials.

Mr. Parker summarized a long list of research projects which are being sponsored entirely or in part by the institute. These projects are far more numerous now than a few years ago, with more than 30 universities and research institutions participating in the program. They constitute a new high level of co-operative research in steel.

"It should be recognized that the complexities of American industry have arrived at a point where much research may be too big for even the largest company in an industry to handle alone," he said. "Problems of this sort, of course, are common throughout the industry, such as those having to do with raw materials, or fundamental manufacturing processes used by all companies. It is in problems of that sort that the institute has its major interest. It is obvious that when a large number of companies within an industry co-operate to solve problems of that nature, the small company is on exactly the same basis as the large company in reaping benefits of the results obtained."

The famous iron pillar of Delhi has been preserved for centuries, but it would not withstand the corrosive atmosphere of a modern industrial community with occasional wetting by rain and dew, Mr. Lain said. The environment of iron and steel plays a large part in their ability to withstand rust.

Corrosion Classified — Work has been carried on to classify different types of corrosion according to environment of metal, he said. Corrosion can be classified into seven classifications, depending upon the nature of surrounding media, these classifications being atmospheric, bacterial, chemical, high-temperature oxidation, soil, stray current electrolysis and underwater.

Natural waters vary according to mineral composition and dissolved gas content. Their effect on metal depends on these factors, the temperatures at which they are used, rate of flow, pressure in the system and formation of protective films. The nature of films deposited by the water on metal is also important in resistance to corrosion.

At Case Institute of Technology, Cleveland, investigations are under way on factors affecting corrosion of galvanized steel pipe by domestic waters, said Mr. Lain. Purpose of this work is to determine the causes of exceptions to the usual long life of galvanized steel pipe in corrosive natural waters and to develop means of overcoming those causes.

Twenty Years To Prepare — The iron and steel industry has roughly 20 years in which to prepare for exhaustion of high-grade iron ores, but a vast quantity of low-grade ore exists, according to Francis X. Tartaron, manager of ore research, Jones & Laughlin Steel Corp., Pittsburgh, who presented a paper on "Beneficiation of Northern Iron Ores." On the eastern end of the Mesabi range a portion of this ore is of such nature that it may be treated economically

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The new five-million dollar Rod Mill of the Colorado Fuel and Iron Corp. at Pueblo, Col. marks the highest and most important achievement in the progress of steel wire making.

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for use in the blast furnaces today. Hence, the transition from high to low-grade iron ore is already taking place, he said.

In discussing the nature and quantity of low-grade ores, Mr. Tartaron divided them into two classes—taconite and intermediate type ores. The former exists in very large quantities and is the basis for reserves in the future, but require expensive methods for treatment. The latter can be treated for blast furnace use economically, but the available quantity is relatively low.

No clear cut production can be made at present on the final exhaustion of the high-grade ores and the ironmaking techniques of the future, Mr. Tartaron stated. These things depend on the success of current experiments in making available the enormous quantities of low-grade ores at reasonable cost.

No other metal can compete with tin for corrosion resistance in food packing, according to John N. Crombie, assistant metallurgical engineer, Carnegie-Illinois Steel Corp., Pittsburgh, speaking on "Tin Plate." Wartime experiments with other metals for food packs conclusively proved the pre-eminence of tin plate for the purpose, he pointed out. Tin cans are practically all steel, with a thin coating of tin.

Canning Technology Changes — New developments taking place in the technology of canning soon should enable canned food to better its position as compared with frozen or fresh food, he continued. These newer packing procedures, which allow shorter cooking time and greater retention of flavor, are now in limited use.

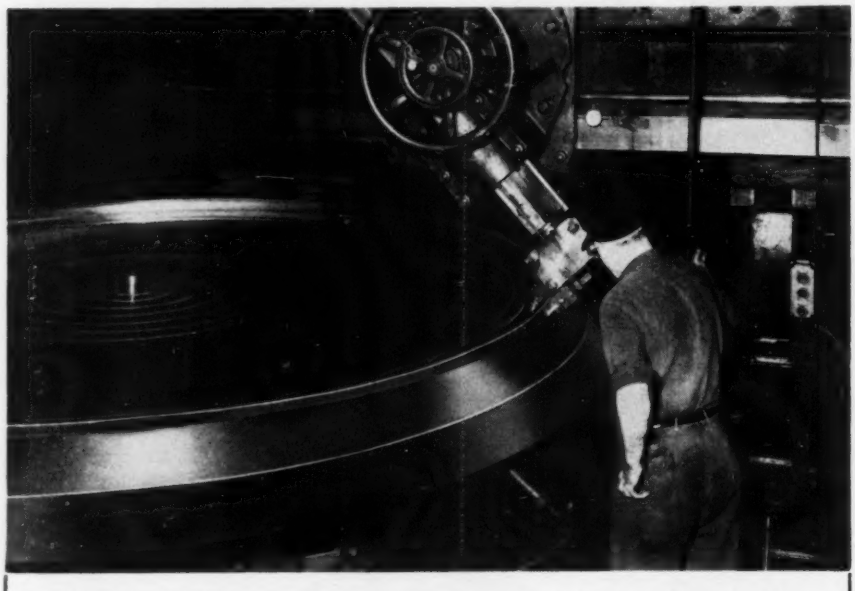
Significant progress has been made in the manufacture of better tin plate for canning, Mr. Crombie asserted. For example, between 1931 and 1944, life expectancy of cans for many fruits and vegetables has more than doubled, in some cases exceeding 96 months, he said. Adoption of cold-reduced steel rather than hot rolled was almost entirely responsible for these improvements in performance of tin plate for canning.

Shortly before World War II, the successful application of the electrolytic process of tin plating made possible the conservation of scarce tin. The process puts a thinner layer of tin on the steel, while affording satisfactory corrosion resistance for many products to be canned.

"During the past 15 years, the tin plate industry has been very progressive, and the present products are the result of much research largely unknown and unappreciated by the public," said Mr. Crombie.

Heat Determines Quality — Steelmakers must carefully control the temperature of molten steel while it is being made because that is one of the most important factors determining its subsequent quality as a sheet, a beam or whatever form it is made into, said J. G. Mravec, melt shop metallurgist, Steel & Tube Division, Timken Roller Bearing Co., Canton, O. His paper was entitled "Bath Temperature Measurements."

The difficulty in control of temperature, however, is to get an accurate indication, Mr. Mravec explained. The desire to attain accuracy has been the driving force back of the development of two new devices that can be dipped into the molten metal without being destroyed—immersion bath pyrometers they are called. By means of photronic cells, thermocouples and other devices, accurate measurements now can be obtained. Their use in the steel industry has expanded rapidly since 1946.



ACCURACY PLUS: Steps seen on the face of this 13-foot diameter forging measure only 0.017-inch deep. This is one of a pair of pole caps installed in a 400 million volt cyclotron to be operated near Pittsburgh by Carnegie Institute of Technology. Forging was machined to an accuracy of 0.0015-inch on major dimensions and to a parallel tolerance of 0.0025-inch in shops of Continental Foundry & Machine Co., Wheeling, W. Va. Accurate dimensions and contour are necessary to control shape of magnetic field in the cyclotron and to properly direct the paths of atomic projectiles used in atom smashing

New Rod Mill

(*Continued from Page* 60)

stands of continuous mills.

Leaving the last continuous intermediate stand, the rod is repeated through a single stand, then reverse repeated into a second single stand and thence either delivered to two pouring reels or reverse repeated a third time to enter a 7-stand high-speed continuous finishing end train.

Rod Mill Proper—The stands in the rod mill proper, numbered in the Morgan conventional method, begin with No. 0; No. 0 to 8, therefore, comprise the roughing end; No. 9 to 13, the intermediate mill; and No. 14 and 15 being individual repeating stands; and No. 16 to 22, inclusive, the high-speed finishing end.

The 6600 v, 3 phase, 60-cycle power for the new rod mill is controlled by twelve sections of General Electric metal-clad switchgear with type AM -15-500 power circuit breakers of 1200 amp capacity and 500,000 kva interrupting rating.

A 6300 hp, 6600 v, synchronous motor drives three 1500 kw, 600 v generators to supply power through adjustable speed control equipment to ten shunt wound, separately excited, adjustable speed, direct current mill drive motors, which with their control were furnished by General Electric.

Operation of all mill motors is controlled by the main mill pulpit operator. A control desk is provided in the mill pulpit which incorporates, in the generator section, controls for coarse and vernier adjustment of generator voltages with voltmeters to indicate the voltage output of the

generators; and in the motor sections, controls to separately adjust the speed of each motor by field control and meters to indicate load and speed.

Operation of a master motor-operated potentiometer rheostat changes the voltage of the entire mill from 0 to 600 v. Voltages of the individual bus sections may be varied independently of each other by operation of their voltage potentiometer rheostats. This permits starting all mill motors by generator field control and also permits simultaneous group speed adjustments. Mill motor control provides for emergency reversal; dynamic braking; overload, undervoltage and over-voltage protection; full field relays; and field accelerating relays.

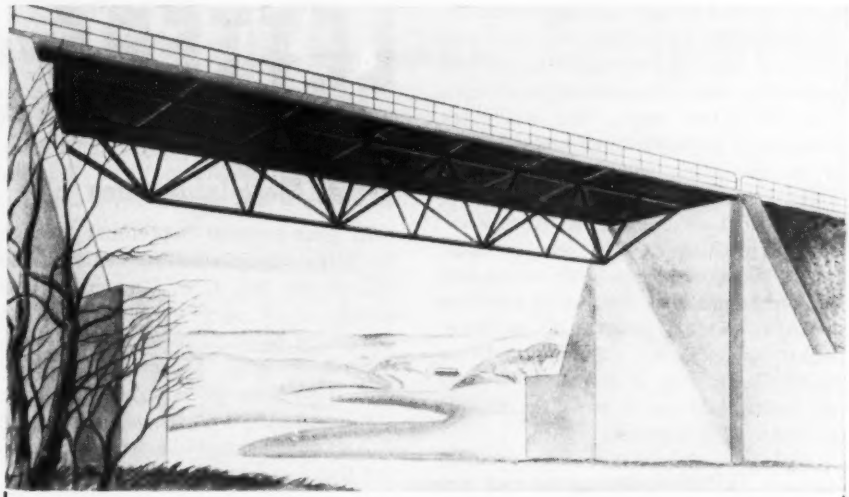
Cleveland Crane and Engineering Co. provided the mill crane which has a 15-ton main hoist, 5-ton auxiliary and a 96-foot span and the billet yard crane which is a 15-ton single hoist with a 96-foot span. Shaw-Box cranes are used in the motor room and roll shop and are of 25-ton, 36½-foot span and 5-ton floor operated 37-foot, 4-inch span respectively.

Roll Shop Equipment — The roll shop building is 40 feet wide and approximately 112 feet long and adjoins the north end of the rod mill building. Roll turning and grinding equipment includes two 18-inch United roll lathes, one 32 x 108-inch Monarch-Keller form turning lathe, and one 20 x 96-inch Landis roll neck grinder.

Various tool grinders for high-speed and carbide tools complete the equipment. Roll storage racks for finished rolls are also located in this building.

Billets for the rod mill are heated in a two-zone heating furnace with a capacity of approximately 60 tons of steel hourly. This furnace was designed and erected by the Rust Furnace Co.

General construction of the furnace is as follows: The hearth is level and is 69 feet, 8½ inches long and 26 feet wide. The walls are encased in steel binding and have vertical expansion joints to allow the brickwork to expand freely without rupturing the steel binding when the furnace is brought up to operating temperature. The roof is completely suspended from the steel framework and refractory hanger tiles are used to hold the roof brick in place. There are two chokes in the furnace. A choke is the decreasing of the space between the roof and the hearth in order to bring the heating gases down to the steel for more efficient heating. One choke is between the soaking zone and the heating zone; the other choke is between the heating zone and the preheating zone.



BRIDGE OF FUTURE: Although not intended to fly, the welded bridge will have a bomber's gracefulness, strength, rigidity and light weight, asserted the James F. Lincoln Arc Welding Foundation, Cleveland, in making the awards in the 1949 welded bridges of the future program. Artist's conception of the design that won the first prize is shown here. Recipient is Thomas C. Kavanagh, professor, civil engineering, Pennsylvania State College, State College, Pa.

The billets enter the preheating zone from the side of the furnace at the back, and are pushed forward by a pusher machine at the back of the furnace. The first 40 feet, 2 inches of hearth is first quality fire brick with cast steel dry skids. The next 11 feet, 6½ inches of the skids to the soaking zone are Carbofrax skids and first quality fire brick, and the last 15 feet, 8 inches of the hearth in the soaking zone is plastic chrome ore rammed into place and fired to 2600° F. The function of the heating zone is to heat the steel billets to approximately rolling temperature. The billets then enter the soaking zone where the heat is allowed to soak into the interior of the billet, thus assuring uniform heat distribution throughout the cross section of the billet. The billets are then side discharged into the break-down rolls of the mill.

Modern Controls Utilized—The following controls are in use: The coke gas pressure is reduced from a pressure of 3 to 5 pounds to 0.75 pounds by a Fisher regulator. The coke gas temperature is controlled by means of a steam heater built by the operators. The gas passes through tubes and the steam passes around the tubes. The temperature is controlled by Masoneilan equipment. The purpose of heating the coke gas is to prevent the deposit of vapor phase gums which exist in coke oven gas. Unless heated these gums deposit in the lines and on controlling butterfly valves, orifices and burner ports. The flow of gas is recorded by a Bailey meter. The remaining controls are best described in the order of the action which normally takes place. When the furnace temperature varies from the desired and set control temperature, the action is as follows: A Leeds and Northrup controlling pyrometer causes a change in the gas flow by positioning a motor-driven gas butterfly valve. Orifice plates are installed in the gas and combustion air lines. The orifices are designed so that a given differential from the gas orifice should be balanced with a comparable differential pressure from the air line orifice in order that the proper amount of air is supplied for combustion. The positioning of the air butterfly valve is performed by Askania equipment. When there is a change in the volume of air and gas, the resulting change in flue gas requires a change in the stack damper position in order to maintain the furnace pressure desired. This is also done by Askania equipment. In addition to the meter recording gas flow to the furnace, individual Hays indicating meters are used for the flow of gas and air to each zone.

Holding Furnace Description—The holding furnace receives the steel which has been rolled in the break-down mill. The surface of the steel entering the holding furnace is cooler than the steel in the heating furnace. The function of the holding furnace is to reheat the steel to the temperature desired for rolling to rods. The bar when entering the holding furnace

is 2½ inches square and approximately 34 feet long. Billets are end charged into the furnace which has a plastic chrome ore hearth 37 feet long by 6 feet wide. The walls are encased in steel bindings and the roof is of the same construction as the billet furnace. The controls and safety devices operate in a manner similar to those for the billet furnace.

All the main drive gear cases and pinion stands are lubricated by four DeLaval central lubricating systems, using an extreme pressure additive type oil. System A is located in one oil cellar and systems B, C, and D are located in a second cellar.

System A has a capacity of 5000 gallons and a circulating rate of 120 gallons per minute. This system lubricates the gears and bearings of the drive for the four stands of the breakdown mill, the drives for the charging and pushout mechanisms of both the billet heating and holding furnaces, the drive for the bundle conveyors, and the drive for the billet dividing shear.

System B has a capacity of 13,000 gallons and a circulating rate of 295 gallons per minute. This system lubricates the the gears and bearings of the drives and pinions for rod mill stands No. 0 to 15, inclusive.

System C has a capacity of 4500 gallons and a circulating rate of 90 gallons per minute. This system lubricates the gears, mill pinions and bearings of the drive for finishing stands No. 16 to 22, inclusive.

System D has a capacity of 900 gallons and a circulating rate of 20 gallons per minute. This system lubricates the gears and bearings of six laying reels and two pouring reels.

Each system is equipped with two oil pumps, either of which will circulate the required amount of oil with a maximum discharge pressure of 60 psi. These pumps are automatically controlled by pressure switches so that in starting the system, both pumps will run until the oil lines are full and the operating pressure is reached; then one pump will shut off and will not run unless there is a drop in line pressure of 10 psi (adjustable). By means of a manual switch, the operator is able to change the normal operation from one pump to the other.

Stencil Encyclopedia Offered

SUGGESTED marking applications and shipping data are included in the stencil section of an encyclopedia on marking, available from Pannier Corp., Pittsburgh. Also included are the various types of stencils, stencil inks and supplies available from the company.

LETTERS *to the Editors...*

Wants More Information

In your issue of September 5, page 84, is an article on "Copper-Base Die Alloys" by Mr. J. F. Klement. This article is of very great interest to us, as we have quite a problem with several drawing operations in steel and, if possible we would like to have the composition of the alloy referred to and fairly complete details regarding the casting practice.

G. J. Manson, M. E.
Ammunition Engineer
Canadian Arsenals Ltd.
Ottawa, Canada

We suggest that you contact the author at Ampco Metal Inc., Milwaukee 4, Wisc.—The Editors

Wire for Snow Fencing

Your name has been referred to us as a possible source of information as to addresses of any foundries or manufacturers of wire machines. We are interested in obtaining such a wire machine for the manufacture of snow fencing and corn cribbing. Whom can we contact?

William H. Fenner
2323 First Ave.
Hibbing, Minn.

A list of companies is being forwarded.—The Editors

Query on Wire Forming

We are writing for information on wire-forming and cutting machine manufacturers. Do you know of anyone making these machines?

Frank A. Holmgren
Laton Co.
Minneapolis, Minn.

List of manufacturers is being forwarded.—The Editors

OK To Reprint

May we have your permission to reprint the article. "Planned Lubrication Yields Multiple Benefits Stemming from More Efficient Machine Maintenance," which appeared in the Aug. 15, 1949 issue of STEEL? Some of our men feel it will be advantageous to them in their work.

L. J. Schmidt
Greenlee Bros. & Co.
Rockford, Ill.

Permission granted.—The Editors

Organization of Production

Please advise the writer whether STEEL has published any articles on the organization of production and if same are available. Specifically what I have in mind is a diagrammed outline or other literature showing, for example, a scheduling of operations from the start to finish in the manufacture of cutting tools. The scheduling of any like product would be suitable.

H. G. Johnstin
Metallurgical Engineer
Vanadium-Alloys Steel Co.
Latrobe, Pa.

Articles, copies of which are being sent, appeared in the Feb. 16, 1948, Aug. 25, 1947, Oct. 20, 1947 and Sept. 29, 1947 issues of STEEL.—The Editors

Descaling Data Sought

It is our recollection that some months ago you carried an article in STEEL on the descaling of steel blooms by a sodium hydroxide process. Our French company desires some information on this process and we would appreciate it if you would locate this article and send us a copy.

D. C. Miner, Advertising Manager
E. F. Houghton & Co.
Philadelphia, Pa.

We believe the article referred to is "Sodium Hydride Descaling", which appeared in the Nov. 12, 1945 issue of STEEL on p. 122. The descaling process is also covered in the following articles: "Descaling Stainless Steel," Nov. 19, 1945, p.120; "Descaling and Desanding Gray Iron Castings," July 15, 1946, p. 104; "Sodium Hydride Effective in Descaling Stainless Steel Sheets," April 5, 1948, p. 107; "Production of Plates," Part I, May 23, 1949, p. 114.—The Editors

Concerning Fly Ash

In your Sept. 19, 1949 issue of STEEL, on page 98, there is an article telling of a paper by Carl E. Miller discussing the problems of fly ash in the small factory. I was wondering if you could forward the information by Mr. Miller or if you could tell me where such information might be acquired.

R. E. Rooth
Maintenance Engineer
Worthington Pump & Machinery Corp.
Wellsville, N. Y.

Copies of the paper, "What Can the Small Plant Do About Fly Ash," by Carl E. Miller, technical advisor, Battelle Memorial Institute, may be obtained from Bituminous Coal Research Inc., 912 Oliver Bldg., Pittsburgh 22, Pa.—The Editors

Flow Charts for Training

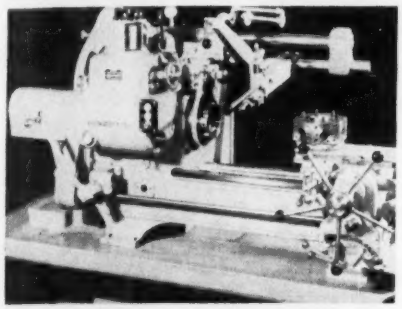
If now available, I would appreciate receiving 50 copies of the Flow Chart of Raw Materials and Finished Products in 1948, which appeared in the Feb. 7, 1949 issue of STEEL on p. 100. These will be of great assistance in a training course shortly to be conducted.

H. O. Johnson
General Superintendent
American Steel & Wire Co.
Central Furnaces & Coke Works
Cleveland, O.

New Products and Equipment

Attachment Speeds Chasing

Single-point chasing operations in nonferrous metals are speeded by an overhead threading attachment available for universal turret lathes made by Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, O. It is mounted at rear of turret lathe headstock and extends a screw-adjustment slide tool holder to the right of the spindle. A fixed overhead bar supports a counterweighted



chasing bar on which a guide arm and the chasing tool arm are located.

When the chasing tool arm is lowered, a follower at headstock end of chasing bar engages a leader driven by gears from the spindle to move the bar and attached tool longitudinally in accordance with pitch of leader-follower combination chosen. Arm can be located anywhere along the chasing bar, and the threading length which can be cut at one time is 4¼ inches. Pipe threading may be performed with the attachment. A brake is also furnished to be attached to the headstock with a belt loop which surrounds the chuck, to further speed the cycle.

Check No. 1 on Reply Card for more Details

Lubricator Lengthens Die Life

Increased punching and shearing output and lengthened die life are advantages claimed for an automatic force-feed spray lubricator announced by Manzel Inc., Buffalo, N. Y. The unit, which intermittently sprays punch and shear operations with oil, is thorough and produces cleaner working and operating conditions.

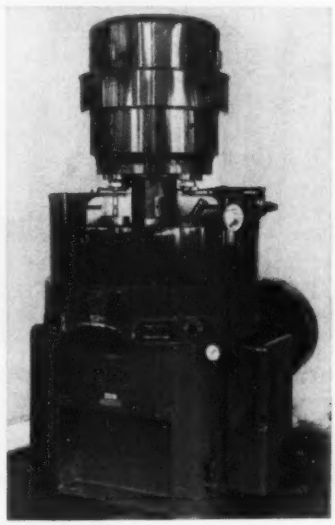
Synchronized directly with the machines on which the unit operates, the lubricators force automatically timed jets of oil mist directly onto the punches, shearing edges, dies or other parts. Compressed air and oil are fed simultaneously into a sprayer nozzle aimed at the critical area. The air stream has a cooling effect upon the die surfaces as well as providing lubrication. Unit may be used for large or small operations.

Check No. 2 on Reply Card for more Details

Lathe Continuous in Operation

Nonproductive indexing time is eliminated in the continuous operating No. 54 four-spindle vertical lathe manufactured by Baird Machine Co., Stratford, Conn. The compact machine measures 42⅝ x 59⅜ inches and is 76 inches high. Positioning of the work spindle before it stops rotating and a swivel joint in each holding fixture, permitting the fixture to be swung out for loading and unloading, speeds the machine's operation.

Each spindle has a set of cutting tools. Alternate spindles are set up



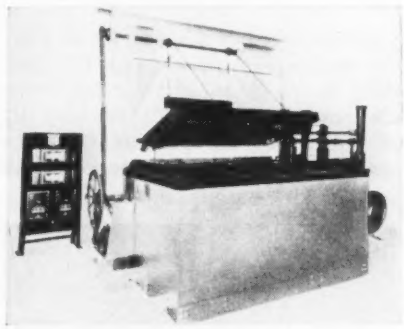
to machine two different sizes; as the spindle carrier, in which the four work spindles and four cutter bars are mounted, rotates at a speed of 15 seconds per revolution, a piece is delivered every 3.75 seconds. Total productivity is 900 pieces per hour. A micrometer adjustment is built into each cutter bar for individual adjustment when tools are resharpened. Coolant may be supplied by either an individual coolant tank or from a centralized system.

Check No. 3 on Reply Card for more Details

Salt Bath for Stainless Parts

Fired with natural, artificial or any of the liquid petroleum gases is a portable salt bath for descaling processes on stainless steel parts, made by James H. Knapp Co., 839 E. 4th St., Los Angeles 13, Calif. The I-beam based, gas-fired unit is heated by two immersion tubes equipped with air-operated eductors to insure proper travel of gases. Operation is at about 930° F.

Furnace is encased in a heavily insulated steel shell. A motor driven hinged lid covers the top and is equipped with limit switches and up and down pushbutton station. Operation may be manual, if desired. All



burners are electrically ignited and have flame failure cutouts. Heat is regulated by an automatic temperature indicating control and over-temperature cut-out.

Check No. 4 on Reply Card for more Details

Box Facilitates Handling

Release of two locking pins on the Trans-A-Box, made by Production Accessories Co., 123 East Goldengate Ave., Detroit 3, Mich., allows the unit to fold quickly to 25 per cent of its former bulk, thus eliminating storage and shipping problems. Box is built of heavy gage, expanded metal, supported by a steel framework.

It requires no liners and is arc welded throughout. There is an unobstructed 4-inch entry all around the base for handling.

Check No. 5 on Reply Card for more Details

Rigidized Tubing Offered

Process for rolling textured patterns in flat metal which redistributes the metal through the cross section, thus increasing the stiffness, strength and impact value as well as producing attractive patterns, is being applied to tube manufacture by Standard Tube Co., 24400 Plymouth Rd., Detroit, Mich. Made under agreement with Rigidized Metals Corp., Buffalo, N. Y., the carbon steel tubing is made from strip into which the patterns have been rolled by forming and resistance welding. Where weight-strength ratio is a factor, lighter materials may be used.

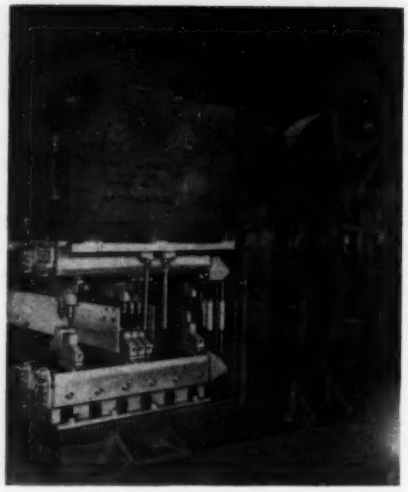
No polishing of the tubing for electroplating is necessary, the fine surface defects being hidden by the reflection of light from the patterned

material. Often the copper plating can be eliminated before nickel and chromium. At present, four patterns are being produced, in sizes from ½ to 5½ inches OD, 16 Birmingham wire gage (0.065-inch) to 22 BWG (0.028-inch). Squares, rectangles and other special shapes are available. It can be furnished in stainless steel, as well as mild carbon steel and low alloy high tensile steels.

Check No. 6 on Reply Card for more Details

Punch Tools for Quick Setup

Quick initial setup and instantaneous shifting of punch and die positions to pick up off-gage-line holes are possible with an adjustable set of punch tools for punching webs of beams and channels, angles and

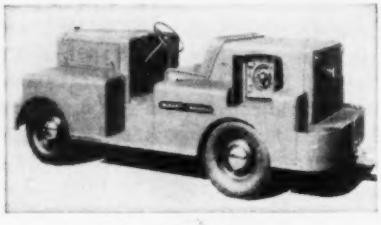


plates, made by Beatty Machine & Mfg. Co., Hammond, Ind. Punch and die units move together as a unit, with movement controlled by a hand crank. It fits any Beatty toggle beam punch.

Check No. 7 on Reply Card for more Details

Self-Propelled Arc Welder

Equipped to go to a job under its own power and make on-the-spot repairs with arc welding, oxyacetylene welding and cutting and power tools is the movable Weldmobile, made by



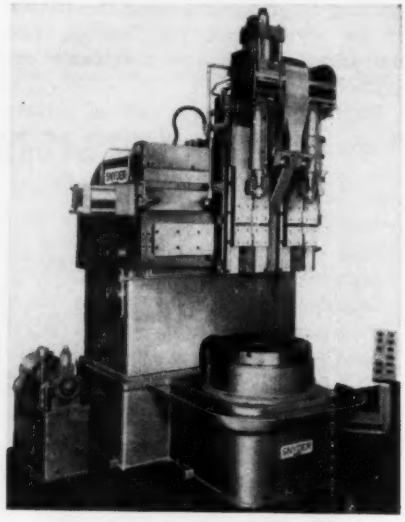
Hobart Brothers Co., Box 389, Troy, O. Two models are being produced, the GR-301-M with a 300 amp welder for light to heavy welding requirements and the GR-401-M with a 400 amp welder for medium to extra heavy requirements.

Either unit can be furnished with a 1 or 3 kw auxiliary direct current power for lights and power tools. A universal coupler is provided to permit towing of additional equipment.

Check No. 8 on Reply Card for more Details

Vertical Hydraulic Lathe

Designed to develop maximum efficiency from the use of carbide tooling is a special heavy-duty vertical hydraulic lathe, built by Snyder Tool & Engineering Co., Detroit, Mich. It is adaptable to facing, boring or turning a variety of large work pieces



by changing fixtures and tool holders. The vertical welded steel column carries a hydraulically operated, horizontal cross slide upon which are mounted two hydraulically operated vertical tool slides.

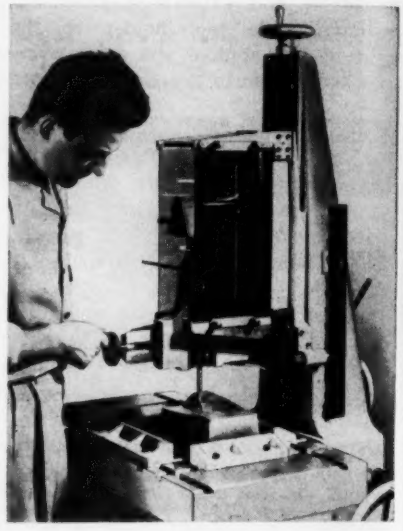
Each tool slide is equipped with T-slots and keyways for mounting tool blocks and holders. Horizontal slide has a 21-inch stroke and vertical slides have 14-inch strokes. A 30-inch variable speed, rotating table is mounted on the base and is equipped with T-slots and pilot for mounting fixtures or chucks. Machine can be set for various combinations of automatic cycling.

Check No. 9 on Reply Card for more Details

Die Checker is Semiautomatic

Means for fast and accurate visual gaging of contour profiles, flash and striking surfaces of forging dies and punches is provided by the Pant-O-Scriber die checker developed by Engineers Specialties Div., Universal Engraving & Colorplate Co. Inc., 980 Ellicott St., Buffalo 8, N. Y. As a tracer moves across the die in the X plane, a scribing cutter on the other end of the tracer arm duplicates the movements and in so doing cuts or scribes the colored film from the Pant-O-Scriber glass. The arm is also mounted on a cross beam in the Y-plane, providing an accurate free movement in both X and Y planes.

As the arm is indexed to the second gaging position, determined by gage block settings, the glass is also indexed and the second of up to nine sections is scribed on the same glass. Glass plate is placed on the measuring stage of a Vu-graph Delineascope

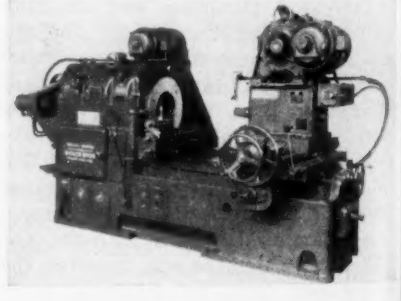


in register with a master chart. Both chart and glass are in proper focal plane and both are projected onto screen. Die contour and master, in contrasting colors, are in true relationship to each other as projected on the screen. Machine will accommodate die blocks weighing up to 800 pounds and sizes up to 12 x 14 x 22 inches.

Check No. 10 on Reply Card for more Details

Miller for Various Threads

Threads may be milled to the closest tolerances on the lead, form, pitch diameter and finish with the No. 30 Smalley general thread miller,

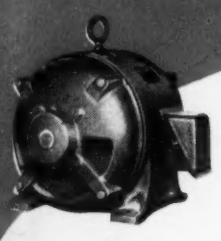


manufactured by Wickes Brothers Division of Wickes Corp., Saginaw, Mich. Machine employs a multiple ring tooth cutter for milling straight and tapered, inside and outside, right and left hand threads. A taper up

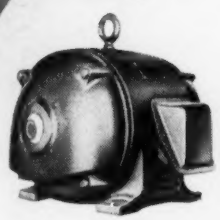
There's a Century MOTOR To Supply Dependable Power For All Popular Applications

Century motors are available in sizes from 1/6 to 400 horsepower, in a wide range of types and kinds — single phase and polyphase alternating current, and direct current. All of them are ruggedly built to assure top performance throughout a long service life.

POLYPHASE

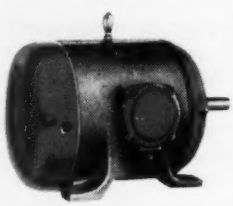


Type SC—OPEN PROTECTED—Form J, general purpose motor—meets the needs for most installations where operating conditions are relatively clean and dry. The top half of the motor frame is closed to keep out falling solids or dripping liquid.

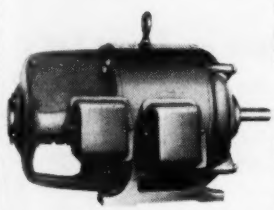


Type SC—SPLASH PROOF—gives the necessary protection where plants must be washed down—keeps water out of the motor even when a hose is applied directly on the frame. Also provides protection against rain, snow, sleet and ice for outdoor installations.

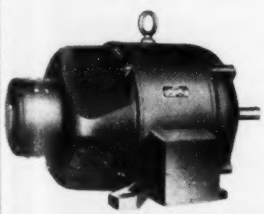
Type SC—TOTALLY ENCLOSED FAN COOLED—protects against dusts, mist or fog detrimental to the vital parts of the motor. The inner frame protecting the motor is sealed to keep out harmful matter.



Type SC—EXPLOSION PROOF protects against atmospheres charged with explosive dusts or gases. They carry Underwriters' label for specific kinds of hazards.

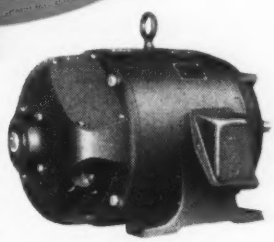


Type SR—SLIP RING- wound rotor motors are suitable for applications requiring low starting current with high starting torque, reversing, or adjustable speed.

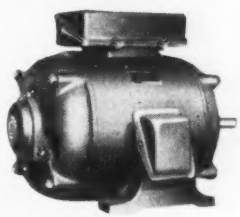


Type SY—SYNCHRONOUS MOTORS- suitable for continuous operation at a uniform load for power factor correction.

SINGLE PHASE



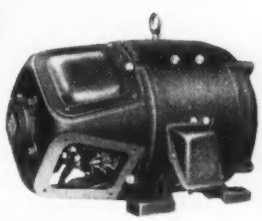
Type RS—REPULSION START INDUCTION—single phase brush lifting motor suitable for applications requiring high starting torque with low starting current.



Type CSH—CAPACITOR START INDUCTION—single phase motor suitable when high starting torque with normal starting current is required.

Type SP—SPLIT PHASE, INDUCTION—single phase motors—suitable for light starting duty.

DIRECT CURRENT



Type DN—DIRECT CURRENT MOTORS—suitable for use where direct current is available or its use desirable.

These illustrations are typical of Century's complete line of motors. Others available include gear motors, generators, AC and DC motor generator sets.

Specify the right Century motor for all your electric power requirements.

Popular types of standard ratings are generally available from factory and branch office stocks.

CENTURY ELECTRIC COMPANY

1806 Pine Street
St. Louis 3, Missouri

Century C MOTORS

Offices and Stock Points in Principal Cities

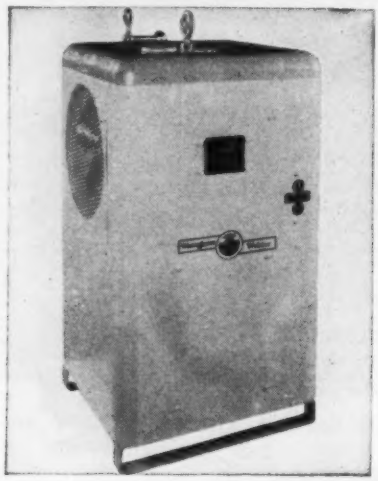
to 4 inches per foot and a range of 1 to 28 threads per inch are possible.

Large diameter work is handled with the 10½ or 15½-inch hydraulically operated 3-jaw wedge chuck. It may be equipped with a 4-jaw independent chuck or a face plate with boring mill jaws. Factors contributing to high production rate are rigid construction, a range of milling spindle speeds from 50 to 300 rpm and a range of main spindle speeds from 1.52 to 41 rpm for milling and 3.08 to 83 rpm for turning.

Check No. 11 on Reply Card for more Details

DC Welder Has Low Load Loss

The no-load loss in a 300 amp direct current plate-type rectifier welder is 500 watts, according to Westinghouse Electric Corp., Pittsburgh 30, Pa. These new welders are rated in accordance with NEMA standards for



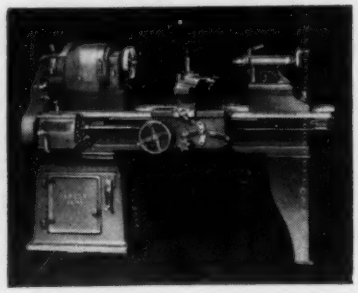
industrial type, single-operator, arc welders and are available in 200, 300 and 400 amp ratings.

Major components of the new type welders are three-phase welding transformer, three-phase adjustable reactor and a plate-type selenium three-phase, full-wave rectifier. Efficiency at full load is 66 per cent, increasing at reduced load conditions to 73 per cent at 20 per cent rated load. A simple terminal board provides means of connecting the welder for 220 or 440-v operation.

Check No. 12 on Reply Card for more Details

16 Spindle Speed Lathe

The 16 spindle speeds ranging from 11 to 727 rpm on the 24-inch swing lathe made by South Bend Lathe Works, 390 E. Madison St., South Bend 22, Ind., suit it for machining large diameter work that is not excessively heavy and within the capacity of the machine. Maximum swing over saddle cross slide with chip guard is 18¾ inches and without chip guard, 19¼ inches. Distance between centers varies from 30 to 102 inches, depending upon bed length. Power longitudinal cross-feeds range from 0.0015 to 0.0841-



inch and cross-feeds from 0.0006 to 0.0312-inch.

Full quick change gear mechanism provides 48 pitches of screw threads ranging from 4 to 224 per inch, left or right hand. A two-speed motor transmits the power by belt to the headstock cone pulley. Slow speeds are driven through back gears.

Check No. 13 on Reply Card for more Details

Induction Heating Unit

A manually operated tap switch allows the operator to compensate for line voltage changes in an induction heating unit produced by High Frequency Heating Division, Lindberg Engineering Co., 2444 W. Hub-

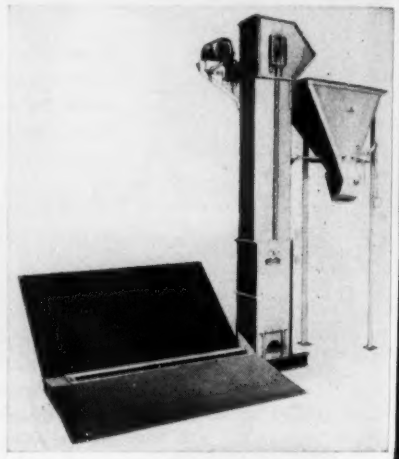
bard St., Chicago 12, Ill. Type LI-25 unit has rated output of 25 kw at 100 per cent duty cycle with a normal frequency of 450,000 cycles per second. They are available for use with 230, 460 and 550 v, 3 phase, 60 cycle power.

A closed system circulates temperature-controlled distilled water through water-cooled components. Transformers automatically control filament voltages. Indicating lamps reveal abnormal conditions at any one of the protective devices. Standard equipment includes a synchronous timer with vernier heat cycle adjustment and additional circuits to control two other operations such as quench, fixture movement, etc. Unit is offered with one or two working stations.

Check No. 14 on Reply Card for more Details

Sand Handling System

Requiring no pit or foundation, a packaged unit foundry sand handling system for individual floors, made by Newaygo Engineering Co., Newaygo, Mich., drops sand directly into the flask with the pulling of an overhead handle. Conditioned sand is deposited over the feeder or can be



discharged onto the feeder from a portable sand conditioner. The feeder delivers sand to a bucket elevator which carries it up to an aerator at the top, which discharges ready-to-use sand into a hopper.

As the hopper becomes emptied the molder pushes a button to refill it from the heap. One motor operates the entire Handy Sandy unit. Headroom requirements are low. Optional equipment includes a hand draw bin.

Check No. 15 on Reply Card for more Details

Boring Head for Turret Lathe

Manufactured in three sizes for use in any type of boring machine or turret lathe is the offset boring head of Everede Tool Co., 200 N. Parkside Ave., Chicago 39, Ill. A direct-reading fraction type dial assures accurate adjustment. By having the lead screw off-center of the head, it is possible to adjust the length of the boring bars for shallow or deep hole boring.

Extension attachments furnished for the larger and intermediate size heads increase their capacity 50 per cent. Facing operations are performed with the use of a removable collar

No upkeep . . .
No rotting, warping, shrinking, swelling . . .
No wonder! It's because ALUMINUM LASTS

We popped up with a radical idea back in 1930. *Windows of Alcoa Aluminum!* It was sound, for windows had always meant care and trouble, in a home or any other kind of building. But a good idea wasn't enough.

So we took it from there.

Developed aluminum alloys with the needed combination of strength and corrosion-resistance. Designed aluminum shapes just right for window frames, bought big presses to squeeze them out like toothpaste from a tube. Pioneered welding methods and fasteners to assemble them. We advertised these things year after year to window manufacturers and buyers.

Last year, over a million aluminum windows went on the job to end window troubles. Because we backed an idea with the investment that makes Alcoa Aluminum a good buy. ALUMINUM COMPANY OF AMERICA, 2115X Gulf Building, Pittsburgh 19, Penna. Sales offices in principal cities.

ALCOA **FIRST IN ALUMINUM**
THE METAL THAT LASTS

available for each size head. Collar has retractable pins which permit either a 0.0025 or 0.005-inch feed per revolution. All of the heads utilize the jig boring bars equipped with triangular tool bits of solid carbide, tantung, stellite or high speed steel.

Check No. 16 on Reply Card for more Details

• • •

SHOP CONVEYOR: Available in 6 and 8 foot lengths, a new Pressman shop conveyor is offered by Arrow Products Inc., Grand Rapids, Mich. The 12-inch pliable belt is three ply fabric, impregnated with Neoprene rubber, resistant to water, grease, dirt, oil and abrasion from sharp metal objects.

Check No. 17 on Reply Card for more Details

SLOT NUTS: Slot nuts of a special alloy bronze with threads that will not bind on the studs and will not strip are offered by Hardware Mfg. Co., Bridgeport 4, Conn. Nuts are offered in eight sizes: ½-inch for ½-inch studs, ⅝-inch for ⅝-inch studs, ¾-inch for ¾-inch studs, ⅞ inch for ⅞ and ¾-inch studs, 1-inch for 1, ⅞, ¾-inch studs.

Check No. 18 on Reply Card for more Details

PURIFIER: Type RA line purifier which removes oil, water, pipe scale, rust and sediment from compressed air and steam lines is introduced by Centrifix Corp., Cleveland 15, O. It is designed for use in horizontal or vertical downflow position on steam lines up to 400 pounds gage and 650° F and for compressed air or gas not exceeding 800 pounds gage and 100° F nonshock service.

Check No. 19 on Reply Card for more Details

UPENDER DEVICE: Turning heavy cylindrical items 90 degrees from horizontal to vertical or vice versa, is easily accomplished by an upending device for use with fork lift trucks. Made by Clark Equipment Co., Battle Creek, Mich., it is available for both gas and electric Clark fork-lift trucks of 2000-pound capacity.

Check No. 20 on Reply Card for more Details

PACKING MATERIAL: Crane Packing Co., Chicago, Ill., announces that its new chemically inert packing material, Chemlon, is now available in molded form in a wide variety of shapes. It is not attacked by any acids or alkalis and is effective to temperatures of 450° F.

Check No. 21 on Reply Card for more Details

CAST IRON VALVE: Type No. 709, a 30-inch 50-pound cast iron valve equipped with 125 pound flanges and a renewable one-piece rubber seat for positive shut off, is offered by R-S Products Corp., Philadelphia 44, Pa. It is air bubble tight at 80 psi and drip tight with water at 100 psi.

Check No. 22 on Reply Card for more Details

GRINDING CHUCK: Abrasive Associates, Providence 3, R. I., developed a new type of segmental grinding chuck that in basic design is standardized so that two sizes of abrasive segments cover all grinding wheel requirements for vertical and horizontal spindles, face grinders.

Check No. 23 on Reply Card for more Details

WATERPROOF SWITCH: Model ES-14 switch for actuating electric counters is introduced by Production Instrument Co., Chicago 6, Ill. Switch arm is operated by a 1-inch diameter rubber wheel.

Check No. 24 on Reply Card for more Details

POWER BRUSH: For scrubbing strip and sheet steel, a new Master rotary brush has been developed by Osborn Mfg. Co., Cleveland, O. It is produced in units in lengths from 4 to 22 inches and in diameters from 8 to 12 inches with larger diameters available if desired.

Check No. 25 on Reply Card for more Details

WELDING CLAMP: Pro-Clamp was created to hold plates, bars, tubing, etc., while parts are being united by welding, brazing or soldering. Made by Bernard Welding Equipment Co., Chicago 19, Ill., clamps are rotatably mounted and can be preset at any angle from 0 to 180 degrees.

Check No. 26 on Reply Card for more Details

LUBRICANT: Die Slick No. 9 is a new lubricant for pressure die casting dies which may be applied with brush or spray. Made by G. W. Smith & Sons Inc., Dayton 3, O., it is nontoxic and leaves no carbon, gum or other residue in the die.

Check No. 27 on Reply Card for more Details

CONTROL INSTRUMENTS: A new line of air operated control instruments, designated as series 500 controllers, are offered by Bristol Co., Waterbury, Conn. Included are controllers for automatically controlling temperature, pressure, flow, liquid level, humidity and pH value.

Check No. 28 on Reply Card for more Details

DC MOTOR: A 1/100-hp dc motor that can be used for any type of application requiring linear or rotary motion is offered by Electro-Aire Inc., North Hollywood, Calif. Running torque is 1 inch ounce at 10,000 rpm, 28 v dc, but is adaptable to other torque and speed requirements.

Check No. 29 on Reply Card for more Details

SOLDERING DEVICE: Stern Corp., Pittsburgh, Pa., introduces the Solder-Matic, a new soldering device that automatically feeds solder to the tip of the iron. Feeding attachment will fit any standard electric soldering iron from 75 to 250 w and can hold more than 6 feet of solder from 1/16 to 3/16-inch diameter.

Check No. 30 on Reply Card for more Details

SAFETY VALVE: Known as Protectomatic valve, a high pressure hydraulic throttle type valve has been developed by R. D. Wood Co., Philadelphia, Pa. Used to control falling speed of weighted type accumulators, valve acts as an automatic protective device in preventing an accumulator tank or platform from crashing on its bumper blocks.

Check No. 31 on Reply Card for more Details

FITTING: Swagelok, a new fitting for use with any type of metal or plastic tubing, has been developed by Crawford Fitting Co., Cleveland 17, O. It provides leakproof seals at three points. Fitting is slipped onto end of a tube and given one and one quarter turns with a standard wrench.

Check No. 32 on Reply Card for more Details

SPEED DRIVE: An infinitely variable speed transmission designed for small conveyors is announced by Graham Transmissions Inc., Milwaukee 12, Wis. Known as model 20MT, drive delivers all speeds from the desired maximum down to zero and will handle small conveyors usually driven with ¼ or ⅓-hp motors.

Check No. 33 on Reply Card for more Details

PANELBOARD: Designed to provide economical group and branch circuit control of lighting distribution for all industrial and commercial applications, the NTPR panelboard is offered by Trumbull Electric Mfg. Co., Plainville, Conn. It is available in 6 to 42 circuits and will fit standard stud walls without projections.

Check No. 34 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

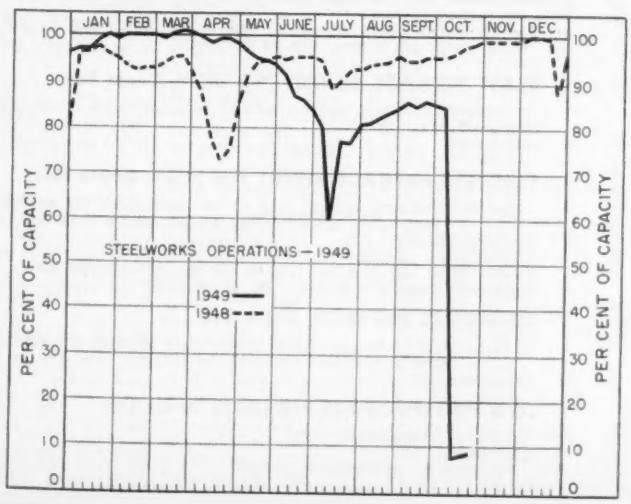
FOURTH week of the steel strike finds metalworking slowing down at a faster pace though still in relatively high gear. Most fabricators are maintaining operations close to pre-strike levels, living off inventories. A few shops are strike-bound, and only a few others have been forced to close or curtail for lack of steel. Certain manufacturers have enough metal for another three or four weeks. Some of them are turning to substitutes, such as aluminum. This latter metal, however, also may be in tight supply soon because of strikes at a number of Aluminum Co. of America plants. In the main, fabricators' prospects are bleak with steel stocks shrinking alarmingly. Unless the strike is quickly ended, general contraction of metalworking is expected by Nov. 1. Even automotive shops that held comfortable steel supplies at the strike's start will be pinched by that time. They already are preparing to cut operations by mid-November.

LABOR—Faint hope for early ending of the strike rests on efforts of government mediators to lay the groundwork for a settlement. But no end of the walkout was in sight late last week. Some steelmakers are beginning to stagger clerical employment, indicating they anticipate no early termination of the dispute. Most labor experts think the government will actively intervene in the dispute once fabricating industry begins to come to a grinding halt. Meanwhile, union policy for closing metalworking shops is vague. Some fabricators have been struck but others have had their contracts extended indefinitely.

OPERATIONS— Steelworks not closed by the strike are pushing production to the limit under ever-mounting consuming demand. The national ingot rate went up 1½ points last week to 91½ per cent of capacity.

DEMAND— Consumers are placing steel orders so as to obtain favorable positions in rolling schedules when the mills resume production. Acute shortages are anticipated in some items, especially flat-rolled, into 1950 as result of strike loss of close to 5 million tons of steel by the end of this week. This loss may never be recovered and may possibly back up deliveries well into first quarter. It is expected in some circles consumers will rush to replenish depleted inventories immediately following strike settlement and force producers to ration some products. On the other hand, a note of apprehension for the future is creeping into the picture. Even after full-scale steel production is resumed snowballing effect of metalworking curtailments cannot be checked immediately. Some shops will require weeks to regain their pre-shutdown stride. Further, the impact of the strike on purchasing power is cause for concern.

PRICES—Uncertainty over the steel price trend is in evidence. First quarter advances are anticipated by some buyers, especially should the union's pension and insurance demands be met. Meanwhile, the market is holding unchanged and no immediate revision in schedules is in sight. Some gray market offerings are appearing but consumers are shying away from them. An important development the past week was shelving of basing point legislation until Congress reconvenes in January. The House passed a conference report but it was stymied in the Senate. STEEL's finished steel weighted index held steady last week at 152.52 and compared with 151.86 a year ago. The arithmetical composite also was unchanged at $91.64 and compared with $95.05 last year. Reflecting downward appraisal of the market by brokers, the steelmaking scrap composite eased to $26.17 from $26.75 and compared with $43.25 a year ago. Pig iron composites held steady and compared with last year as follows: Basic, $45.60 and $46.29; No. 2 foundry, $46.10 and $46.50; malleable, $47.27 and $47.20.



DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended Oct. 22	Change	Same Week 1948	Same Week 1947
Pittsburgh	3.5	None	97	104
Chicago	5	None*	98.5	95
Eastern Pa.	8.5	None	95	91.5
Youngstown	0	None	104	92
Wheeling	61	+ 1.5	91	93.5
Cleveland	0	None	99	90
Buffalo	0	None	104	88.5
Birmingham	6	None	100	99
New England	55	+ 3	87	84
Cincinnati	52	+ 6	103	87
St. Louis	84.5	— 5	89.5	74
Detroit	37	+10*	98	86
Western	21	None	..	..
Estimated national rate	9.5	+ 1.5	98.5	95.5

Based on weekly steelmaking capacity of 1,843,516 net tons for 1949; 1,802,476 net tons for 1948; 1,749,928 tons for 1947. *Change from revised rate.

News Summary—P. 27 Engineering News—P. 57

Composite Market Averages

	Oct. 20 1949	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)	152.52	152.52	152.52	151.86	99.16
Index in cents per lb ..	4.132	4.132	4.132	4.114	2.686
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$91.64	$91.64	$91.55	$95.05	$56.73
No. 2 Fdry Pig Iron, GT	46.10	46.10	46.10	46.50	23.67
Malleable Pig Iron, GT..	47.27	47.27	47.27	47.20	24.29
Basic Pig Iron, GT.....	45.60	45.60	45.60	46.29	23.00
Steelmaking Scrap, GT..	26.17	26.75	27.08	43.25	16.33

Weighted finished steel index based on average shipments and prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Oct. 20 1949	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pitts.	3.35	3.35	3.35	3.35–55	2.15
Bars, H.R., del. Phila. ...	3.83	3.83	3.83	3.79	2.47
Bars, H.R., Chicago	3.35	3.35	3.35	3.35	2.15
Bars, C. F., Pitts.	3.95-4.00	3.95-4.00	3.95-4.00	3.95-4.25	2.65
Bars, C.F., Chicago	4.00	4.00	4.00	4.00	2.65
Shapes, Std., Pitts.	3.25	3.25	3.25	3.25–30	2.10
Shapes, Std., Chicago	3.25	3.25	3.25	3.25	2.10
Shapes, del. Phila.	3.50	3.50	3.50	3.48	2.215
Plates, Pittsburgh	3.40	3.40	3.40	3.40–60	2.10
Plates, Chicago	3.40	3.40	3.40	3.40	2.10
Plates, Coatesville, Pa. ..	3.50	3.50	3.50	3.75	2.10
Plates, Sparrows Point, Md.	3.40	3.40	3.40	3.45	2.10
Plates, Claymont, Del.	3.50	3.50	3.50	3.95	2.10
Plates, del. Phila.	3.59	3.59	3.59	3.71	2.15
Sheets, H.R., Pitts.	3.25	3.25	3.25	3.25–30	2.10
Sheets, H.R., Chicago	3.25	3.25	3.25	3.25	2.10
Sheets, C.R., Pitts.	4.00	4.00	4.00	4.00	3.05
Sheets, C.R., Chicago	4.00	4.00	4.00	4.00	3.05
Sheets, C.R., Detroit	4.20	4.20	4.20	4.20	3.15
Sheets, Galv., Pitts.	4.40	4.40	4.40	4.40	3.50
Strip, H.R., Pitts.	3.25	3.25	3.25	3.25–70	2.10
Strip, H.R., Chicago	3.25	3.25	3.25	3.25–30	2.10
Strip, C.R., Pitts.	4.00	4.00	4.00	4.00–75	2.80
Strip, C.R., Chicago	4.00–15	4.00–15	4.00–15	4.00–25	2.90
Strip, C.R., Detroit	4.20–25	4.20–25	4.20–25	4.20–50	2.90
Wire, Basic, Pitts.	4.15	4.15	4.15	4.15-4.50	2.60
Nails, Wire, Pitts.	5.15	5.15	5.15	5.15-6.30	2.55
Tin plate, box, Pitts.	$7.75	$7.75	$7.75	$6.80	$5.00

SEMIFINISHED

Billets, forging, Pitts.(NT)	$61.00	$61.00	$61.00	$61.00	$40.00
Sheet bar, mill(NT)	51.78–52.00	53.57–52.00	53.57–52.00	67.00	34.00
Wire rods, ½-⅝", Pitts. ..	3.40	3.40	3.40	3.40–4.15	2.00

PIG IRON, Gross Ton

Bessemer, Pitts.	$47.00	$47.00	$47.00	$47.00	$24.50
Basic, Valley	46.00	46.00	46.00	46.00	23.50
Basic, del. Phila.	49.44	49.44	49.44	50.17	25.34
No. 2 Fdry, Pitts.	46.50	46.50	46.50	46.50	24.00
No. 2 Fdry, Chicago.....	46.50	46.50	46.50	43.00-46.50	24.00
No. 2 Fdry, Valley.....	46.50	46.50	46.50	46.50	24.00
No. 2 Fdry, del. Phila. ...	49.94	49.94	49.94	50.67	25.84
No. 2 Fdry, Birmingham..	39.38	39.38	39.38	43.38	20.38
No. 2 Fdry.(Birm.)del Cin.	46.08	46.08	46.08	49.09	24.06
Malleable, Valley	46.50	46.50	46.50	46.50	24.00
Malleable, Chicago	46.50	46.50	46.50	43.50-46.50	24.00
Charcoal, Lyles, Tenn.	60.00	60.00	60.00	62.00	33.00
Ferromanganese, Etna, Pa.	175.00	175.00	175.00	163.00	135.00

SCRAP, Gross Ton

No. 1 Heavy Melt. Pitts. ..	$29.00	$29.75	$29.75	$42.75	$17.25
No. 1 Heavy Melt. E. Pa..	24.00	25.00	25.00	45.25	15.50
No. 1 Heavy Melt. Chicago	25.50	25.50	26.50	41.75	17.50
No. 1 Heavy Melt. Valley..	31.25	31.25	31.25	42.75	16.25
No. 1 Heavy Melt. Cleve....	26.50	26.50	26.50	42.25	16.25
No. 1 Heavy Melt. Buffalo.	28.25	28.25	28.25	48.50	16.75
Rails, Rerolling, Chicago..	41.50	41.50	41.50	66.50	22.25
No. 1 Cast, Chicago	41.50	41.50	41.50	70.50	20.00

COKE, Gross Ton

Beehive, Furn., Connlsvl. .	$13.25	$13.25	$13.25	$14.50	$7.00
Beehive, Fdry., Connlsvl. .	15.75	15.75	15.75	17.00	7.75
Oven, Fdry, Chicago	20.00	20.00	20.00	20.40	13.35

NONFERROUS METALS

Copper, del. Conn.	17.625	17.625	17.625	23.50	12.00
Zinc, E. St. Louis	9.25	9.25	10.00	15.50	8.25
Lead, St. Louis	12.80	13.55	14.925	19.30–35	6.35
Tin, New York	95.75	95.875	103.00	103.00	52.00
Aluminum, del.	17.00	17.00	17.00	17.00	15.00
Antimony, Laredo, Tex.	32.00	32.00	38.50	38.50	14.50
Nickel, refinery, duty paid	40.00	40.00	40.00	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$48.00	$48.50	$49.00	$49.50
Newark,del.	50.63	51.13	51.63	52.13
Brooklyn,N.Y.,del.	....	52.79	53.29	....
Birmingham District				
Birmingham,Ala. R2, S9	38.88	39.38	....	....
Woodward,Ala. W15	38.88	39.38	....	....
Cincinnati,del.	....	46.08	....	....
Buffalo District				
Buffalo H1, R2	46.00	46.50	47.00	....
Tonawanda,N.Y. W12	46.00	46.50	47.00	....
N.Tonawanda,N.Y. T9	....	46.50	47.00	....
Boston,del.	55.26	55.76	56.20	....
Rochester,N.Y.,del.	48.63	49.13	49.63	....
Syracuse,N.Y.,del.	49.58	50.08	50.58	....
Chicago District				
Chicago I-3	46.00	46.50	46.50	47.00
Gary,Ind. C3	46.00	....	46.50	....
IndianaHarbor,Ind. I-2	46.00	....	46.50	....
So.Chicago,Ill. W14	46.00	46.50	46.50	....
So.Chicago,Ill. C3	46.00	....	46.50	47.00
So.Chicago,Ill. Y1	46.00	46.50	46.50	....
Milwaukee,del.	47.89	48.39	48.39	48.89
Muskegon,Mich.del.	....	51.98	51.98	....
Cleveland District				
Cleveland A7	46.00	46.50	46.50	47.00
Cleveland R2	46.00	46.50	46.50	....
Lorain,O. N3	46.00	....	....	47.00
Akron, del. from Cleve.	48.39	48.89	48.89	49.39
Duluth I-3	....	....	46.50	....
Erie,Pa. I-3	46.00	46.50	46.50	47.00
Everett,Mass. E1	....	50.50	51.00	....
Geneva,Utah G1	46.00	46.50	....	....
Seattle,Tacoma,Wash.,del.	....	54.20	....	....
Portland,Oreg., del.	....	54.20	....	....
LosAngeles,SanFrancisco,del.	53.70	54.20	....	....
GraniteCity,Ill. M10	47.90	48.40	48.90	....
St.Louis,del.(incl. tax)	48.65	49.15	49.65	....
Ironton,Utah C11	46.00	46.50	....	....
Minnequa,Colo. C10	47.00	47.50	47.50	....
Pittsburgh District				
NevilleIsland,Pa. P6	46.00	46.50	46.50	47.00
Pitts.N&S sides,Ambridge, Aliquippa,del.	47.19	47.69	47.69	48.19
McKeesRocks,del.	46.95	47.45	47.45	47.95
Lawrenceville,Homestead, McKeesport,Monaca,del.	47.44	47.94	47.94	48.44
Verona,del.	47.90	48.40	48.40	48.90
Brackenridge,del.	48.13	48.63	48.63	49.13
Bessemer,Pa. C3	46.00	....	46.50	47.00
Clairton,Rankin,So.Duquesne,Pa. C3	46.00	....	....	....
McKeesport,Pa. N3	46.00	....	....	47.00
Sharpsville,Pa. S6	46.00	46.50	46.50	47.00
Steelton,Pa. B2	48.00	48.50	49.00	49.50
Steubenville,O. W10	46.00	....	....	....
Struthers,O. S16	46.00	....	....	....
Swedeland,Pa. A3	48.00	48.50	49.00	49.50
Philadelphia,del.	49.44	49.94	50.44	50.94
Toledo,O. I-3	46.00	46.50	46.50	47.00
Cincinnati,del.	51.01	51.51	....	....
Troy,N.Y. R2	48.00	48.50	49.00	....
Youngstown District				
Hubbard,O. Y1	46.00	46.50	46.50	....
Youngstown C3	46.00	....	....	47.00
Youngstown Y1	46.00	46.50	46.50	47.00
Mansfield,O.,del.	50.26	50.76	50.76	51.26

• Low phos, Southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.

Phosphorous: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; Add $1 for each 0.5% Si to 11.50%)

Jackson,O. J1, G2	$59.50
Buffalo H1	60.75

ELECTRIC FURNACE SIVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for 0.045% max. P)

NiagaraFalls,N.Y. P15	$71.50
Keokuk,Iowa, Openhearth & Fdry, frt. allowed K2	77.00
Keokuk,Iowa, OH & Fdry, 12½ lb, piglets, frt. allowed K2..	82.00
Wenatchee,Wash. OH & Fdry, frt. allowed K2	77.00

CHARCOAL PIG IRON, Gross Ton

(Low phos, semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles,Tenn. T3	$60.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$51.00
Steelton,Pa. B2	54.00
Philadelphia delivered	57.09
Troy,N.Y. R2	54.00

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Semifinished and Finished Steel Products

Mill prices on Oct. 20, 1949; cents per pound unless otherwise noted. Price changes are indicated by italic type.
Code number following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)

Detroit R7 .....$50.00
Munhall,Pa. C3 .....50.00

INGOTS, Alloy (NT)

Detroit R7 .....$51.00
Houston,Tex. S5 .....59.00
Midland,Pa. C18 .....51.00
Munhall,Pa. C3 .....51.00
So.Duquesne,Pa. C3 ..51.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)

Bessemer,Pa. C3 .....$52.00
Clairton,Pa. C3 .....52.00
Conshohocken,Pa. A3 ..57.00
Ensley,Ala. T2 .....52.00
Fairfield,Ala. T2 .....52.00
Fontana,Calif. K1 ....71.00
Gary,Ind. C3 .....52.00
Johnstown,Pa. B2 ....52.00
Lackawanna,N.Y. B2 ..52.00
Munhall,Pa. C3 .....52.00
Sharon,Pa. S3 .....52.00
So.Chicago,Ill. C3 ....52.00
So.Duquesne,Pa. C3 ...52.00

Carbon, Forging (NT)

Bessemer,Pa. C3 .....$61.00
Buffalo R2 .....61.00
Canton,O. R2 .....61.00
Clairton,Pa. C3 .....61.00
Cleveland R2 .....61.00
Conshohocken,Pa. A3 ..63.00
Detroit R7 .....61.00
Ensley,Ala. T2 .....61.00
Fairfield,Ala. T2 .....61.00
Fontana,Calif. K1 ....80.00
Gary,Ind. C3 .....61.00
Geneva,Utah G1 .....61.00
Houston,Tex. S5 .....69.00
Ind.Harbor,Ind. I-2 ...61.00
Johnstown,Pa. B2 ....61.00
Lackawanna,N.Y. B2 ..61.00
Munhall,Pa. C3 .....61.00
So.Duquesne,Pa. C3 ..61.00
So.Chicago,Ill. C3, R2..61.00
Warren,O. C17 .....61.00

Alloy (NT)

Bethlehem,Pa. B2 ....$63.00
Buffalo R2 .....63.00
Canton,O. R2, T7 .....63.00
Conshohocken,Pa. A3 ..65.00
Detroit R7 .....63.00
Fontana,Calif. K1 ....82.00
Gary,Ind. C3 .....63.00
Houston,Tex. S5 .....71.00
Johnstown,Pa. B2 ....63.00
Lackawanna,N.Y. B2 ..63.00
Massillon,O. R2 .....63.00
Midland,Pa. C18 .....63.00
Munhall,Pa. C3 .....63.00
Sharon,Pa. S3 .....63.00
So.Chicago,Ill. C3, R2..63.00
So.Duquesne,Pa. C3 ...63.00
Warren,O. C17 .....63.00

SHEET BARS (NT)

Mansfield,O. E6 (GT)$58.00
Portsmouth,O. P12 ....52.00
Sharon,Pa. S3 .....52.00

ROUNDS, SEAMLESS TUBE (NT)

Canton,O. R2 .....$76.00
Cleveland R2 .....76.00
Ind.Harbor,Ind. I-2 ....76.00
Massillon,O. R2 .....76.00
So.Chicago,Ill. R2 ....76.00

SKELP

Aliquippa,Pa. J5 .....3.25
Munhall,Pa. C3 .....3.25
Warren,O. R2 .....3.25
Youngstown C3, R2 ....3.25

WIRE RODS

AlabamaCity,Ala. R2 ..3.40
Cleveland A7 .....3.40
Donora,Pa. A7 .....3.40
Fairfield,Ala. T2 .....3.40
Houston,Tex. S5 .....3.95
Ind.Harbor,Ind. Y1 ....3.40
Johnstown,Pa. B2 .....3.40
Joliet,Ill. A7 .....3.40
LosAngeles B3 .....4.20
Monessen,Pa. P7 .....3.40
Pittsburg,Calif. C11 ...4.05
Portsmouth,O. P12 .....3.40
So.Chicago,Ill. R2 .....3.40
SparrowsPoint B2 .....3.50
Sterling,Ill.(1) N15 ....3.40
Struthers,O. Y1 .....3.40
Torrance,Calif. C11 ....4.20
Worcester,Mass. A7 ....3.70

STRUCTURALS

Wide Flange

Bethlehem,Pa. B2 .....3.30
Lackawanna,N.Y. B2 ..3.30
Munhall,Pa. C3 .....3.20
So.Chicago,Ill. C3 .....3.20

H.-S. Low-Alloy

Aliquippa,Pa. J5 .....4.95
Bessemer,Ala. T2 .....4.95
Bethlehem,Pa.(14) B2 ..5.05
Clairton,Pa. C3 .....4.95
Fairfield,Ala. T2 .....4.95
Fontana,Calif. K1 .....6.10
Gary,Ind. C3 .....4.95
Ind.Harbor,Ind. I-2, Y1 .4.95
Johnstown,Pa. B2 .....5.05
Lackawna,N.Y.(14) B2 .5.05
Munhall,Pa.(14) C3 ....4.95
So.Chicago,Ill.(14) C3 ..4.95
Struthers,O. Y1 .....4.95

Carbon Steel Stand. Shapes

Aliquippa,Pa. J5 .....3.25
Bessemer,Ala. T2 .....3.25
Bethlehem,Pa. B2 .....3.30
Clairton,Pa. C3 .....3.25
Fairfield,Ala. T2 .....3.25
Fontana,Calif. K1 .....3.80
Gary,Ind. C3 .....3.25
Geneva,Utah G1 .....3.25
Houston,Tex. S5 .....3.65
Ind.Harbor,Ind. I-2 ....3.25
Johnstown,Pa. B2 .....3.30
KansasCity,Mo. S5 ....3.85
Lackawanna,N.Y. B2 ...3.30
LosAngeles B3 .....3.85
Minnequa,Colo. C10 ....3.75
Munhall,Pa. C3 .....3.25
Niles,Calif.(22) P1 ....3.97
Portland,Oreg. O4 .....3.90
Seattle B3 .....3.90
So.Chicago,Ill. C3, W14 .3.25
So.SanFrancisco B3 ....3.80
Torrance,Calif. C11 ....3.85
Weirton,W.Va. W6 .....3.25

Alloy Stand. Shapes

Clairton,Pa. C3 .....4.05
Fontana,Calif. K1 .....5.25
Munhall,Pa. C3 .....4.05
So.Chicago,Ill. C3 ....4.05

SHEET STEEL PILING

Ind.Harbor,Ind. I-2 .....4.05
Lackawanna,N.Y. B2 ...4.05
Munhall,Pa. C3 .....4.05
So.Chicago,Ill. C3 .....4.05
Weirton,W.Va. W6 .....4.05

PLATES Carbon Steel

AlabamaCity,Ala. R2 ...3.40
Aliquippa,Pa. J5 .....3.40
Ashland,Ky.(15) A10 ...3.40
Bessemer,Ala. T2 .....3.40
Clairton,Pa. C3 .....3.40
Claymont,Del. W16 ....3.50
Cleveland J5, R2 .....3.40
Coatesville,Pa. L7 .....3.50
Conshohocken,Pa. A3 ...3.50
Ecorse,Mich. G5 .....3.65
Fairfield,Ala. T2 .....3.40
Fontana,Calif. K1 .....4.00
Gary,Ind. C3 .....3.40
Geneva,Utah G1 .....3.40
Harrisburg,Pa. C5 .....3.75
Houston,Tex. S5 .....3.80
Ind.Harbor,Ind. I-2, Y1 .3.40
Johnstown,Pa. B2 .....3.40
Lackawanna,N.Y. B2 ...3.40
Minnequa,Colo. C10 ....4.30
Munhall,Pa. C3 .....3.40
Pittsburgh J5 .....3.40
Seattle B3 .....4.30
Sharon,Pa. S3 .....3.40
So.Chicago,Ill. C3, W14 .3.40
SparrowsPoint,Md. B2 ..3.40
Steubenville,O. W10 ....3.40
Warren,O. R2 .....3.40
Weirton,W.Va. W6 .....3.40
Youngstown C3, Y1 ....3.40

PLATES (Universal Mill)

Fontana,Calif. K1 .....4.30

PLATES, Open-Hearth Alloy

Coatesville,Pa. L7 ....4.50
Conshohocken,Pa. A3 ..4.40
Fontana,Calif. K1 .....5.40
Gary,Ind. C3 .....4.40
Johnstown,Pa. B2 .....4.40
Munhall,Pa. C3 .....4.40
Sharon,Pa. S3 .....4.40
So.Chicago,Ill. C3 ....4.40
SparrowsPoint,Md. B2 ..4.40

PLATES, Ingot Iron

Ashland,cl(15) A10 ....3.65
Ashland,icl(15) A10 ....4.15
Cleveland,cl R2 .....3.65
Warren,O.,cl R2 .....3.65

PLATES, Wrought Iron

Economy,Pa. B14 .....7.85

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5 .....5.20
Bessemer,Ala. T2 .....5.20
Clairton,Pa. C3 .....5.20
Cleveland J5, R2 .....5.20
Conshohocken,Pa. A3 ...5.20
Ecorse,Mich. G5 .....5.45
Fairfield,Ala. T2 .....5.20
Fontana,Calif. K1 .....5.80
Gary,Ind. C3 .....5.20
Geneva,Utah G1 .....5.20
Houston,Tex. S5 .....5.60
Ind.Harbor,Ind. I-2, Y1 .5.20
Johnstown,Pa. B2 .....5.20
Munhall,Pa. C3 .....5.20
Pittsburgh J5 .....5.20
Sharon,Pa. S3 .....5.65
So.Chicago,Ill. C3 .....5.20
SparrowsPoint,Md. B2 ..5.20
Warren,O. R2 .....5.20
Youngstown Y1 .....5.20

FLOOR PLATES

Cleveland J5 .....4.55
Conshohocken,Pa. A3 ...4.55
Harrisburg,Pa. C5 .....4.55
Ind.Harbor,Ind. I-2 ....4.55
Munhall,Pa. C3 .....4.55
So.Chicago,Ill. C3 .....4.55

BARS, Hot-Rolled Carbon

AlabamaCity,Ala. R2 ...3.35
Aliquippa,Pa. J5 .....3.35
Alton,Ill.(1) L1 .....3.35
Ashland,Ky.(17) A10 ..3.35
Atlanta,Ga. A11 .....3.50
Bessemer,Ala. T2 .....3.35
Buffalo R2 .....3.35
Canton,O. R2 .....3.35
Clairton,Pa. C3 .....3.35
Cleveland R2 .....3.35
Ecorse,Mich. G5 .....3.55
Emeryville,Calif. J7 ....4.10
Fairfield,Ala. T2 .....3.35
Fontana,Calif. K1 .....4.00
Gary,Ind. C3 .....3.35
Houston,Tex. S5 .....3.75
Ind.Harbor,Ind. I-2, Y1..3.35
Johnstown,Pa. B2 .....3.35
KansasCity,Mo. S5 ....3.95
Lackawanna,N.Y. B2 ...3.35
LosAngeles B3 .....4.05
Marion,O. P11 .....3.35
Midland,Pa. C18 .....3.35
Milton,Pa. B6 .....3.35
Minnequa,Colo. C10 ....3.85
Niles,Calif. P1 .....4.05
N.Tonawanda,N.Y. B11.3.35
Pittsburg,Calif. C11 ....4.05
Pittsburgh J5 .....3.35
Portland,Oreg. O4 .....4.10
Seattle B3, N14 .....4.10
S.Chicago C3, R2, W14..3.35
So.Duquesne,Pa. C3 ....3.35
S.SanFran.,Cal. B3 ....4.10
Struthers,O. Y1 .....3.35
Torrance,Calif. C11 ....4.05
Weirton,W.Va. W6 .....3.35
Youngstown C3, R2 ...3.35

BARS, Cold-Finished Carbon

Aliquippa,Pa. K5 .. ...4.00
Ambridge,Pa. W18 .....4.00
BeaverFalls,Pa. M12, R2...4.00
Buffalo B5 .....4.00
Camden,N.J. P13 .....4.48
Carnegie,Pa. C12 .....4.00
Chicago W18 .....4.00
Cleveland A7, C20 ....4.00
Cumberland,Md. C19 ...3.95
Donora,Pa. A7 .....4.00
Ecorse,Mich. G5 .....4.30
Elyria,O. W8 .....4.00
FranklinPark,Ill. N5 ...4.00
Gary,Ind. R2 .....4.00
Hammond,Ind. L2, M13..4.00
Hartford,Conn. R2 .....4.40
Harvey,Ill. B5 .....4.00
Indianapolis M13 .....4.20
LosAngeles R2 .....5.40
Mansfield,Mass B5 ....4.40
Massillon,O. R2, R8....4.00
Midland,Pa. C18 .. ...4.00
Monaca,Pa. S17 .....4.00
Newark,N.J. W18 .....4.40
Plymouth,Mich. P5 ....4.25
Pittsburgh J5 .....3.95
Putnam,Conn. W18 ....4.40
Readville,Mass. C14 ...4.40
St.Louis,Mo. M5 .....4.35
So.Chicago,Ill. W14 ....4.00
SpringCity,Pa.(5) K3 ..4.48
Struthers,O. Y1 .....4.00
Waukegan,Ill. A7 .. ...4.00
Youngstown F3, Y1 ...4.00

BAR SIZE ANGLES; S. SHAPES

Aliquippa,Pa. J5 .....3.35
Atlanta,Ga. A11 .. ...3.50
Bethlehem,Pa.(2) B2 ..3.55
Johnstown,Pa. B2 .....3.35
Lackawanna,N.Y. B2 ..3.35
Niles,Calif. P1 .....4.05
Pittsburgh(23) J5 .....3.35
Portland,Oreg. 04 .....4.10
SanFrancisco S7 .....4.05
Weirton,W.Va. W6 .....3.35

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. C3 .....4.00
Fontana,Calif. K1 .....4.75
Gary,Ind. C3 .....4.00
Youngstown C3 .....4.00

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy

Aliquippa,Pa. J5 .....5.10
Bessemer,Ala. T2 .....5.10
Bethlehem,Pa. B2 .....5.10
Clairton,Pa. C3 .....5.10
Cleveland R2 .....5.10
Ecorse,Mich. G5 .....5.30
Fairfield,Ala. T2 .....5.10
Fontana,Calif. K1 .....6.15
Gary,Ind. C3 .....5.10
Ind.Harbor,Ind. I-2, Y1..5.10
Johnstown,Pa. B2 .....5.10
Lackawanna,N.Y. B2 ..5.10
Pittsburgh J5 .....5.10
So.Duquesne,Pa. C3 ....5.10
Struthers,O. Y1 .....5.10
Youngstown C3 .....5.10

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 .....3.75
Buffalo R2 .....3.75
Canton,O. R2, T7 .....3.75
Clairton,Pa. C3 .....3.75
Ecorse,Mich. G5 .....4.05
Fontana,Calif. K1 .....4.75
Gary,Ind. C3 .....3.75
Houston,Tex. S5 .....4.15
Ind.Harbor,Ind. I-2, Y1..3.75
Johnstown,Pa. B2 .....3.75
KansasCity,Mo. S5 .....4.35
Lackawanna,N.Y. B2 ...3.75
LosAngeles B3 .....4.80
Massillon,O. R2 .....3.75
Midland,Pa. C18 .....3.75
S.Chicago C3, R2, W14..3.75
So.Duquesne,Pa. C3 ...3.75
Struthers,O. Y1 .....3.75
Warren,O. C17 .....3.75
Youngstown C3 .....3.75

BARS, Cold-Finished Alloy

Aliquippa,Pa. K5 .....4.65
Ambridge,Pa. W18 .....4.65
BeaverFalls,Pa. M12 ...4.65
Bethlehem,Pa. B2 .....4.65
Buffalo B5 .....4.65
Canton,O. R2, T7 .....4.65
Carnegie,Pa. C12 .....4.65
Chicago W18 .....4.65
Cleveland A7, C20 .....4.65
Donora,Pa. A7 .....4.65
Elyria,O. W8 .....4.65
Gary,Ind. R2 .....4.65
Hammond,Ind. L2, M13.4.65
Hartford,Conn. R2 ....4.95
Harvey,Ill. B5 .....4.65
Indianapolis M13 .....4.85
Lackawanna,N.Y. B2 ..4.65
Mansfield,Mass. B5 ....4.95
Massillon,O. R2, R8....4.65
Midland,Pa. C18 .. ...4.65
Monaca,Pa. S17 .....4.65
Newark,N.J. W18 .....4.95
So.Chicago,Ill. R2, W14.4.65
Struthers,O. Y1 .....4.65
Waukegan,Ill. A7 .....4.65
Worcester,Mass. A7 ....4.95
Youngstown F3, Y1 ....4.65

BARS, Reinforcing (Fabricators)

AlabamaCity,Ala. R2 ...3.35
Alton,Ill.(6) L1 .....3.35
Atlanta,Ga. A11 .....3.50
Buffalo R2 .....3.35
Cleveland R2 .....3.35
Emeryville,Calif. J7 ....4.10
Fairfield,Ala. T2 .....3.35
Fontana,Calif. K1 .....4.00
Gary,Ind. C3 .....3.35
Houston,Tex. S5 .....3.75
Ind.Harbor,Ind. I-2, Y1..3.35
Johnstown,Pa. B2 .....3.35
KansasCity,Mo. S5 .....3.95
Lackawanna,N.Y. B2 ..3.35
LosAngeles B3 .....4.05
Minnequa,Colo. C10 ....4.25
Niles,Calif. P1 .....4.05
Pittsburg,Calif. C11 ....4.05
Pittsburgh J5 .....3.35
Portland,Oreg. O4 .....4.10
Seattle,Wash. B3, N14..4.10
So.Chicago,Ill. R2 .....3.35
So.Duquesne,Pa. C3 ...3.35
So.SanFrancisco B3 ....4.10
SparrowsPoint,Md. B2 ..3.35
Struthers,O. Y1 .....3.35
Torrance,Calif. C11 ....4.05
Youngstown C3, R2 ....3.35

BARS, Reinforcing (Fabricated; to Consumers)

Huntington,W.Va. W7 ..4.50
Johnstown,¼-1" B2 ....4.25
LosAngeles B3 .....5.00
Marion,O. P11 .....4.25
Pittsburgh J5 .....4.25
Seattle B3, N14 ... .5.00
So.SanFrancisco B3 ....5.00
SparrowsPt.,1¼-1¼" B2.4.83
SparrowsPt.,¼-1" B2 ..4.25

RAIL STEEL BARS

ChicagoHts.,Ill.(3) I-2..3.25
FortWorth,Tex.(4) T4 ..4.33
Hntngtn,W.Va.(3,4) W7.3.35
Moline,Ill.(3) R2 .....3.35
Williamsport(2,3) S19 ..3.35
Williamsport(4) S19 ....3.85

BARS, Wrought Iron

Economy,Pa.(S.R.)B14..9.50
Economy,Pa.(D.R.)B14.11.00
Economy(Stablt) B14 ..11.30
McK.Rks.(S.R.) L5 ....8.60
McK.Rks.(D.R.) L5 ...11.25
McK.Rks.(Staybolt) L5.12.75

BARS, Hot-Rolled Ingot Iron

Ashland,Ky.(17) A10 ..3.60

SHEETS, Hot-Rolled Steel (18 gage and heavier)

AlabamaCity,Ala. R2 ..3.25
Ashland,Ky.(8) A19 ....3.25
Butler,Pa. A10 .....3.25
Cleveland J5, R2 .....3.25
Conshohocken,Pa. A3 ..3.35
Ecorse,Mich.(8) G5 ....3.45
Fairfield,Ala. T2 ... ...3.25
Fontana,Calif. K1 .....4.15
Gary,Ind. C3 .....3.25
Ind.Harbor,Ind. I-2, Y1..3.25
Irvin,Pa. C3 .....3.25
Kokomo,Ind. C16 .....3.35
Lackawanna,N.Y. B2 ...3.25
Munhall,Pa. C3 .....3.25
Pittsburg,Calif. C11 ....3.95
Pittsburgh J5 .....3.25
Sharon,Pa. S3 .....3.25
So.Chicago,Ill. W14 ....3.25
SparrowsPoint,Md. B2 ..3.25
Steubenville,O. W10 ....3.25
Torrance,Calif. C11 ....3.95
Warren,O. R2 .....3.25
Weirton,W.Va. W6 ....3.25
Youngstown C3, Y1 ....3.25

SHEETS, Hot-Rolled Carbon Steel (19 gage and lighter)

AlabamaCity,Ala. R2 ...4.40
Dover,O. R1 .....5.00
Fairfield,Ala. T2 .....4.15
Ind.Harbor,Ind. I-2 ....4.15
Kokomo,Ind. C16 .....4.25
Mansfield,O. E6 .....4.15
Niles,O. N12, M4 .....4.15
Torrance,Calif. C11 ....5.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10 .....4.00
Cleveland J5 R2 .....4.00
Ecorse,Mich. G5 .....4.20
Fairfield,Ala. T2 .....4.00
Follansbee,W.Va. F4 ...4.00
Fontana,Calif. K1 .....4.90
Gary,Ind. C3 .....4.00
GraniteCity,Ill. G4 .....4.20
Ind.Harbor,Ind. I-2, Y1..4.00
Irvin,Pa. C3 .....4.00
Lackawanna,N.Y. B2 ...4.00
Middletown,O. A10 .....4.00
Pittsburg,Calif. C11 ....4.95
Pittsburgh J5 .....4.00
SparrowsPoint,Md. B2 ..4.00
Steubenville,O. W10 ....4.00
Warren,O. R2 .....4.00
Weirton,W.Va. W6 .....4.00
Youngstown Y1 .....4.00

SHEETS, Cold-Rolled, High-Strength Low-Alloy

Cleveland J5, R2 . ....6.05
Ecorse,Mich. G5 ... .6.25
Fontana,Calif. K1 .....6.95
Gary,Ind. C3 ....6.05
Ind.Harbor,Ind. I-2, Y1..6.05
Irvin,Pa. C3 .....6.05
Lackawanna,N.Y. B2 ...6.05
Pittsburgh J5 .....6.05
Sharon,Pa. S3 .....6.05
SparrowsPoint,Md. B2 ..6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 ....6.05
Youngstown Y1 .....6.05

Composite Market Averages

	Oct. 20 1949	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)	152.52	152.52	152.52	151.86	99.16
Index in cents per lb ..	4.132	4.132	4.132	4.114	2.686
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$91.64	$91.64	$91.55	$95.05	$56.73
No. 2 Fdry Pig Iron, GT	46.10	46.10	46.10	46.50	23.67
Malleable Pig Iron, GT..	47.27	47.27	47.27	47.20	24.29
Basic Pig Iron, GT.....	45.60	45.60	45.60	46.29	23.00
Steelmaking Scrap, GT..	26.17	26.75	27.08	43.25	16.33

Weighted finished steel index based on average shipments and prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Oct. 20 1949	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pitts.	3.35	3.35	3.35	3.35–55	2.15
Bars, H.R., del. Phila. ...	3.83	3.83	3.83	3.79	2.47
Bars, H.R., Chicago	3.35	3.35	3.35	3.35	2.15
Bars, C. F., Pitts.	3.95-4.00	3.95-4.00	3.95-4.00	3.95-4.25	2.65
Bars, C.F., Chicago	4.00	4.00	4.00	4.00	2.65
Shapes, Std., Pitts.	3.25	3.25	3.25	3.25–30	2.10
Shapes, Std., Chicago	3.25	3.25	3.25	3.25	2.10
Shapes, del. Phila.	3.50	3.50	3.50	3.48	2.215
Plates, Pittsburgh	3.40	3.40	3.40	3.40–60	2.10
Plates, Chicago	3.40	3.40	3.40	3.40	2.10
Plates, Coatesville, Pa. ..	3.50	3.50	3.50	3.75	2.10
Plates, Sparrows Point, Md.	3.40	3.40	3.40	3.45	2.10
Plates, Claymont, Del.	3.50	3.50	3.50	3.95	2.10
Plates, del. Phila.	3.59	3.59	3.59	3.71	2.15
Sheets, H.R., Pitts.	3.25	3.25	3.25	3.25–30	2.10
Sheets, H.R., Chicago	3.25	3.25	3.25	3.25	2.10
Sheets, C.R., Pitts.	4.00	4.00	4.00	4.00	3.05
Sheets, C.R., Chicago	4.00	4.00	4.00	4.00	3.05
Sheets, C.R., Detroit	4.20	4.20	4.20	4.20	3.15
Sheets, Galv., Pitts.	4.40	4.40	4.40	4.40	3.50
Strip, H.R., Pitts.	3.25	3.25	3.25	3.25–70	2.10
Strip, H.R., Chicago	3.25	3.25	3.25	3.25–30	2.10
Strip, C.R., Pitts.	4.00	4.00	4.00	4.00–75	2.80
Strip, C.R., Chicago	4.00–15	4.00–15	4.00–15	4.00–25	2.90
Strip, C.R., Detroit	4.20–25	4.20–25	4.20–25	4.20–50	2.90
Wire, Basic, Pitts.	4.15	4.15	4.15	4.15-4.50	2.60
Nails, Wire, Pitts.	5.15	5.15	5.15	5.15-6.30	2.55
Tin plate, box, Pitts.	$7.75	$7.75	$7.75	$6.80	$5.00

SEMIFINISHED

Billets, forging, Pitts.(NT)	$61.00	$61.00	$61.00	$61.00	$40.00
Sheet bar, mill(NT)	51.78–52.00	53.57–52.00	53.57–52.00	67.00	34.00
Wire rods, ⅜-⅝", Pitts. ..	3.40	3.40	3.40	3.40–4.15	2.00

PIG IRON, Gross Ton

Bessemer, Pitts.	$47.00	$47.00	$47.00	$47.00	$24.50
Basic, Valley	46.00	46.00	46.00	46.00	23.50
Basic, del. Phila.	49.44	49.44	49.44	50.17	25.34
No. 2 Fdry, Pitts.	46.50	46.50	46.50	46.50	24.00
No. 2 Fdry, Chicago.....	46.50	46.50	46.50	43.00-46.50	24.00
No. 2 Fdry, Valley.....	46.50	46.50	46.50	46.50	24.00
No. 2 Fdry, del. Phila. ...	49.94	49.94	49.94	50.67	25.84
No. 2 Fdry, Birmingham..	39.38	39.38	39.38	43.38	20.38
No. 2 Fdry.(Birm.)del Cin.	46.08	46.08	46.08	49.09	24.06
Malleable, Valley	46.50	46.50	46.50	46.50	24.00
Malleable, Chicago	46.50	46.50	46.50	43.50-46.50	24.00
Charcoal, Lyles, Tenn.	60.00	60.00	60.00	62.00	33.00
Ferromanganese, Etna, Pa.	175.00	175.00	175.00	163.00	135.00

SCRAP, Gross Ton

No. 1 Heavy Melt. Pitts. ..	$29.00	$29.75	$29.75	$42.75	$17.25
No. 1 Heavy Melt. E. Pa..	24.00	25.00	25.00	45.25	15.50
No. 1 Heavy Melt. Chicago	25.50	25.50	26.50	41.75	17.50
No. 1 Heavy Melt. Valley..	31.25	31.25	31.25	42.75	16.25
No. 1 Heavy Melt. Cleve...	26.50	26.50	26.50	42.25	16.25
No. 1 Heavy Melt. Buffalo.	28.25	28.25	28.25	48.50	16.75
Rails, Rerolling, Chicago..	41.50	41.50	41.50	66.50	22.25
No. 1 Cast, Chicago	41.50	41.50	41.50	70.50	20.00

COKE, Gross Ton

Beehive, Furn., Connlsvl. .	$13.25	$13.25	$13.25	$14.50	$7.00
Beehive, Fdry., Connlsvl. .	15.75	15.75	15.75	17.00	7.75
Oven, Fdry, Chicago	20.00	20.00	20.00	20.40	13.35

NONFERROUS METALS

Copper, del. Conn.	17.625	17.625	17.625	23.50	12.00
Zinc, E. St. Louis	9.25	9.25	10.00	15.50	8.25
Lead, St. Louis	12.80	13.55	14.925	19.30–35	6.35
Tin, New York	95.75	95.875	103.00	103.00	52.00
Aluminum, del.	17.00	17.00	17.00	17.00	15.00
Antimony, Laredo, Tex. ..	32.00	32.00	38.50	38.50	14.50
Nickel, refinery, duty paid	40.00	40.00	40.00	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$48.00	$48.50	$49.00	$49.50
Newark,del.	50.63	51.13	51.63	52.13
Brooklyn,N.Y.,del.	....	52.79	53.29	....
Birmingham District				
Birmingham,Ala. R2, S9	38.88	39.38	....	....
Woodward,Ala. W15	38.88	39.38	....	....
Cincinnati,del.	....	46.08	....	....
Buffalo District				
Buffalo H1, R2	46.00	46.50	47.00	....
Tonawanda,N.Y. W12	46.00	46.50	47.00	....
N.Tonawanda,N.Y. T9	....	46.50	47.00	....
Boston,del.	55.26	55.76	56.20	....
Rochester,N.Y.,del.	48.63	49.13	49.63	....
Syracuse,N.Y.,del.	49.58	50.08	50.58	....
Chicago District				
Chicago I-3	46.00	46.50	46.50	47.00
Gary,Ind. C3	46.00	....	46.50	....
IndianaHarbor,Ind. I-2	46.00	....	46.50	....
So.Chicago,Ill. W14	46.00	46.50	46.50	....
So.Chicago,Ill. C3	46.00	....	46.50	47.00
So.Chicago,Ill. Y1	46.00	46.50	46.50	....
Milwaukee,del.	47.89	48.39	48.39	48.89
Muskegon,Mich.del.	....	51.98	51.98	....
Cleveland District				
Cleveland A7	46.00	46.50	46.50	47.00
Cleveland R2	46.00	46.50	46.50	....
Lorain,O. N3	46.00	....	....	47.00
Akron, del. from Cleve.	48.39	48.89	48.89	49.39
Duluth I-3	....	....	46.50	....
Erie,Pa. I-3	46.00	46.50	46.50	47.00
Everett,Mass. E1	....	50.50	51.00	....
Geneva,Utah G1	46.00	46.50	....	....
Seattle,Tacoma,Wash.,del.	....	54.20	....	....
Portland,Oreg., del.	....	54.20	....	....
LosAngeles,SanFrancisco,del.	53.70	54.20	....	....
GraniteCity,Ill. M10	47.90	48.40	48.90	....
St.Louis,del.(incl. tax)	48.65	49.15	49.65	....
Ironton,Utah C11	46.00	46.50	....	....
Minnequa,Colo. C10	47.00	47.50	47.50	....
Pittsburgh District				
NevilleIsland,Pa. P6	46.00	46.50	46.50	47.00
Pitts.N&S sides,Ambridge, Aliquippa,del.	47.19	47.69	47.69	48.19
McKeesRocks,del.	46.95	47.45	47.45	47.95
Lawrenceville,Homestead, McKeesport,Monaca,del.	47.44	47.94	47.94	48.44
Verona,del.	47.90	48.40	48.40	48.90
Brackenridge,del.	48.13	48.63	48.63	49.13
Bessemer,Pa. C3	46.00	....	46.50	47.00
Clairton,Rankin,So.Duquesne,Pa. C3	46.00	....	....	....
McKeesport,Pa. N3	46.00	....	....	47.00
Sharpsville,Pa. S6	46.00	46.50	46.50	47.00
Steelton,Pa. B2	48.00	48.50	49.00	49.50
Steubenville,O. W10	46.00	....	....	....
Struthers,O. S16	46.00	....	....	....
Swedeland,Pa. A3	48.00	48.50	49.00	49.50
Philadelphia,del.	49.44	49.94	50.44	50.94
Toledo,O. I-3	46.00	46.50	46.50	47.00
Cincinnati,del.	51.01	51.51	....	....
Troy,N.Y. R2	48.00	48.50	49.00	....
Youngstown District				
Hubbard,O. Y1	46.00	46.50	46.50	....
Youngstown C3	46.00	....	....	47.00
Youngstown Y1	46.00	46.50	46.50	47.00
Mansfield,O.,del.	50.26	50.76	50.76	51.26

• Low phos, Southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.

Phosphorous: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; Add $1 for each 0.5% Si to 11.50%)

Jackson,O. J1, G2	$59.50
Buffalo H1	60.75

ELECTRIC FURNACE SIVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for 0.045% max. P)

NiagaraFalls,N.Y. P15	$71.50
Keokuk,Iowa, Openhearth & Fdry, frt. allowed K2	77.00
Keokuk,Iowa, OH & Fdry, 12½ lb, piglets, frt. allowed K2..	82.00
Wenatchee,Wash. OH & Fdry, frt. allowed K2	77.00

CHARCOAL PIG IRON, Gross Ton

(Low phos, semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles,Tenn. T3	$60.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$51.00
Steelton,Pa. B2	54.00
Philadelphia delivered	57.09
Troy,N.Y. R2	54.00

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Semifinished and Finished Steel Products

Mill prices on Oct. 20, 1949; cents per pound unless otherwise noted. Price changes are indicated by italic type.
Code number following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)

Detroit R7 .....$50.00
Munhall,Pa. C3 .....50.00

INGOTS, Alloy (NT)

Detroit R7 .....$51.00
Houston,Tex. S5 .....59.00
Midland,Pa. C18 .....51.00
Munhall,Pa. C3 .....51.00
So.Duquesne,Pa. C3 ...51.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)

Bessemer,Pa. C3 .....$52.00
Clairton,Pa. C3 .....52.00
Conshohocken,Pa. A3 ..57.00
Ensley,Ala. T2 .....52.00
Fairfield,Ala. T2 .....52.00
Fontana,Calif. K1 ....71.00
Gary,Ind. C3 .....52.00
Johnstown,Pa. B2 ....52.00
Lackawanna,N.Y. B2 ..52.00
Munhall,Pa. C3 .....52.00
Sharon,Pa. S3 .....52.00
So.Chicago,Ill. C3 ....52.00
So.Duquesne,Pa. C3 ...52.00

Carbon, Forging (NT)

Bessemer,Pa. C3 .....$61.00
Buffalo R2 .....61.00
Canton,O. R2 .....61.00
Clairton,Pa. C3 .....61.00
Cleveland R2 .....61.00
Conshohocken,Pa. A3 ..63.00
Detroit R7 .....61.00
Ensley,Ala. T2 .....61.00
Fairfield,Ala. T2 .....61.00
Fontana,Calif. K1 ....80.00
Gary,Ind. C3 .....61.00
Geneva,Utah G1 .....61.00
Houston,Tex. S5 .....69.00
Ind.Harbor,Ind. I-2 ...61.00
Johnstown,Pa. B2 ....61.00
Lackawanna,N.Y. B2 ..61.00
Munhall,Pa. C3 .....61.00
So.Duquesne,Pa. C3 ..61.00
So.Chicago,Ill. C3, R2..61.00
Warren,O. C17 .....61.00

Alloy (NT)

Bethlehem,Pa. B2 ....$63.00
Buffalo R2 .....63.00
Canton,O. R2, T7 .....63.00
Conshohocken,Pa. A3 ..65.00
Detroit R7 .....63.00
Fontana,Calif. K1 ....82.00
Gary,Ind. C3 .....63.00
Houston,Tex. S5 .....71.00
Johnstown,Pa. B2 ....63.00
Lackawanna,N.Y. B2 ..63.00
Massillon,O. R2 .....63.00
Midland,Pa. C18 .....63.00
Munhall,Pa. C3 .....63.00
Sharon,Pa. S3 .....63.00
So.Chicago,Ill. C3, R2..63.00
So.Duquesne,Pa. C3 ...63.00
Warren,O. C17 .....63.00

SHEET BARS (NT)

Mansfield,O. E6 (GT)$58.00
Portsmouth,O. P12 ....52.00
Sharon,Pa. S3 .....52.00

ROUNDS, SEAMLESS TUBE (NT)

Canton,O. R2 .....$76.00
Cleveland R2 .....76.00
Ind.Harbor,Ind. I-2 ....76.00
Massillon,O. R2 .....76.00
So.Chicago,Ill. R2 ....76.00

SKELP

Aliquippa,Pa. J5 .....3.25
Munhall,Pa. C3 .....3.25
Warren,O. R2 .....3.25
Youngstown C3, R2 ....3.25

WIRE RODS

AlabamaCity,Ala. R2 ..3.40
Cleveland A7 .....3.40
Donora,Pa. A7 .....3.40
Fairfield,Ala. T2 .....3.40
Houston,Tex. S5 .....3.95
Ind.Harbor,Ind. Y1 ....3.40
Johnstown,Pa. B2 .....3.40
Joliet,Ill. A7 .....3.40
LosAngeles B3 .....4.20
Monessen,Pa. P7 .....3.40
Pittsburg,Calif. C11 ...4.05
Portsmouth,O. P12 .....3.40
So.Chicago,Ill. R2 .....3.40
SparrowsPoint B2 .....3.50
Sterling,Ill.(1) N15 ....3.40
Struthers,O. Y1 .....3.40
Torrance,Calif. C11 ....4.20
Worcester,Mass. A7 ....3.70

STRUCTURALS

Wide Flange

Bethlehem,Pa. B2 .....3.30
Lackawanna,N.Y. B2 ..3.30
Munhall,Pa. C3 .....3.20
So.Chicago,Ill. C3 .....3.20

H.-S. Low-Alloy

Aliquippa,Pa. J5 .....4.95
Bessemer,Ala. T2 .....4.95
Bethlehem,Pa.(14) B2 ..5.05
Clairton,Pa. C3 .....4.95
Fairfield,Ala. T2 .....4.95
Fontana,Calif. K1 .....6.10
Gary,Ind. C3 .....4.95
Ind.Harbor,Ind. I-2, Y1 .4.95
Johnstown,Pa. B2 .....5.05
Lackawna,N.Y.(14) B2 .5.05
Munhall,Pa.(14) C3 ....4.95
So.Chicago,Ill.(14) C3 ..4.95
Struthers,O. Y1 .....4.95

Carbon Steel Stand. Shapes

Aliquippa,Pa. J5 .....3.25
Bessemer,Ala. T2 .....3.25
Bethlehem,Pa. B2 .....3.30
Clairton,Pa. C3 .....3.25
Fairfield,Ala. T2 .....3.25
Fontana,Calif. K1 .....3.80
Gary,Ind. C3 .....3.25
Geneva,Utah G1 .....3.25
Houston,Tex. S5 .....3.65
Ind.Harbor,Ind. I-2 ....3.25
Johnstown,Pa. B2 .....3.30
KansasCity,Mo. S5 ....3.85
Lackawanna,N.Y. B2 ...3.30
LosAngeles B3 .....3.85
Minnequa,Colo. C10 ....3.75
Munhall,Pa. C3 .....3.25
Niles,Calif.(22) P1 ....3.97
Portland,Oreg. O4 .....3.90
Seattle B3 .....3.90
So.Chicago,Ill. C3, W14 .3.25
So.SanFrancisco B3 ....3.80
Torrance,Calif. C11 ....3.85
Weirton,W.Va. W6 .....3.25

Alloy Stand. Shapes

Clairton,Pa. C3 .....4.05
Fontana,Calif. K1 .....5.25
Munhall,Pa. C3 .....4.05
So.Chicago,Ill. C3 ....4.05

SHEET STEEL PILING

Ind.Harbor,Ind. I-2 .....4.05
Lackawanna,N.Y. B2 ...4.05
Munhall,Pa. C3 .....4.05
So.Chicago,Ill. C3 .....4.05
Weirton,W.Va. W6 .....4.05

PLATES Carbon Steel

AlabamaCity,Ala. R2 ...3.40
Aliquippa,Pa. J5 .....3.40
Ashland,Ky.(15) A10 ...3.40
Bessemer,Ala. T2 .....3.40
Clairton,Pa. C3 .....3.40
Claymont,Del. W16 ....3.50
Cleveland J5, R2 .....3.40
Coatesville,Pa. L7 .....3.50
Conshohocken,Pa. A3 ...3.50
Ecorse,Mich. G5 .....3.65
Fairfield,Ala. T2 .....3.40
Fontana,Calif. K1 .....4.00
Gary,Ind. C3 .....3.40
Geneva,Utah G1 .....3.40
Harrisburg,Pa. C5 .....3.75
Houston,Tex. S5 .....3.80
Ind.Harbor,Ind. I-2, Y1 .3.40
Johnstown,Pa. B2 .....3.40
Lackawanna,N.Y. B2 ....3.40
Minnequa,Colo. C10 ....4.30
Munhall,Pa. C3 .....3.40
Pittsburgh J5 .....3.40
Seattle B3 .....4.30
Sharon,Pa. S3 .....3.40
So.Chicago,Ill. C3, W14 .3.40
SparrowsPoint,Md. B2 ..3.40
Steubenville,O. W10 ....3.40
Warren,O. R2 .....3.40
Weirton,W.Va. W6 .....3.40
Youngstown C3, Y1 ....3.40

PLATES (Universal Mill)

Fontana,Calif. K1 .....4.30

PLATES, Open-Hearth Alloy

Coatesville,Pa. L7 ....4.50
Conshohocken,Pa. A3 ..4.40
Fontana,Calif. K1 .....5.40
Gary,Ind. C3 .....4.40
Johnstown,Pa. B2 .....4.40
Munhall,Pa. C3 .....4.40
Sharon,Pa. S3 .....4.40
So.Chicago,Ill. C3 .....4.40
SparrowsPoint,Md. B2 ..4.40

PLATES, Ingot Iron

Ashland,cl(15) A10 ....3.65
Ashland,lcl(15) A10 ....4.15
Cleveland,cl R2 .....3.65
Warren,O.,cl R2 .....3.65

PLATES, Wrought Iron

Economy,Pa. B14 .....7.85

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5 .....5.20
Bessemer,Ala. T2 .....5.20
Clairton,Pa. C3 .....5.20
Cleveland J5, R2 .....5.20
Conshohocken,Pa. A3 ...5.20
Ecorse,Mich. G5 .....5.45
Fairfield,Ala. T2 .....5.20
Fontana,Calif. K1 .....5.80
Gary,Ind. C3 .....5.20
Geneva,Utah G1 .....5.20
Houston,Tex. S5 .....5.60
Ind.Harbor,Ind. I-2, Y1 .5.20
Johnstown,Pa. B2 .....5.20
Munhall,Pa. C3 .....5.20
Pittsburgh J5 .....5.20
Sharon,Pa. S3 .....5.65
So.Chicago,Ill. C3 .....5.20
SparrowsPoint,Md. B2 ..5.20
Warren,O. R2 .....5.20
Youngstown Y1 ... .5.20

FLOOR PLATES

Cleveland J5 .....4.55
Conshohocken,Pa. A3 ...4.55
Harrisburg,Pa. C5 .....4.55
Ind.Harbor,Ind. I-2 ....4.55
Munhall,Pa. C3 .....4.55
So.Chicago,Ill. C3 .....4.55

BARS, Hot-Rolled Carbon

AlabamaCity,Ala. R2 ...3.35
Aliquippa,Pa. J5 .....3.35
Alton,Ill.(1) L1 .....3.35
Ashland,Ky.(17) A10 ..3.35
Atlanta,Ga. A11 .....3.50
Bessemer,Ala. T2 .....3.35
Buffalo R2 .....3.35
Canton,O. R2 .....3.35
Clairton,Pa. C3 .....3.35
Cleveland R2 .....3.35
Ecorse,Mich. G5 .....3.55
Emeryville,Calif. J7 ....4.10
Fairfield,Ala. T2 .....3.35
Fontana,Calif. K1 .....4.00
Gary,Ind. C3 .....3.35
Houston,Tex. S5 .....3.75
Ind.Harbor,Ind. I-2, Y1..3.35
Johnstown,Pa. B2 .....3.35
KansasCity,Mo. S5 .....3.95
Lackawanna,N.Y. B2 ...3.35
LosAngeles B3 .....4.05
Marion,O. P11 .....3.35
Midland,Pa. C18 .....3.35
Milton,Pa. B6 .....3.35
Minnequa,Colo. C10 ....3.85
Niles,Calif. P1 .....4.05
N.Tonawanda,N.Y. B11.3.35
Pittsburg,Calif. C11 ....4.05
Pittsburgh J5 .....3.35
Portland,Oreg. O4 .....4.10
Seattle B3, N14 .....4.10
S.Chicago C3, R2, W14..3.35
So.Duquesne,Pa. C3 ....3.35
S.SanFran.,Cal. B3 ....4.10
Struthers,O. Y1 .....3.35
Torrance,Calif. C11 ....4.05
Weirton,W.Va. W6 .....3.35
Youngstown C3, R2 ...3.35

BARS, Cold-Finished Carbon

Aliquippa,Pa. K5 .....4.00
Ambridge,Pa. W18 .....4.00
BeaverFalls,M12, R2...4.00
Buffalo B5 .....4.00
Camden,N.J. P13 .....4.48
Carnegie,Pa. C12 .....4.00
Chicago W18 .....4.00
Cleveland A7, C20 .....4.00
Cumberland,Md. C19 ...3.95
Donora,Pa. A7 .....4.00
Ecorse,Mich. G5 .....4.30
Elyria,O. W8 .....4.00
FranklinPark,Ill. N5 ...4.00
Gary,Ind. R2 .....4.00
Hammond,Ind. L2, M13..4.00
Hartford,Conn. R2 .....4.40
Harvey,Ill. B5 .....4.00
Indianapolis M13 .....4.20
LosAngeles R2 .....5.40
Mansfield,Mass B5 ....4.40
Massillon,O. R2, R8....4.00
Midland,Pa. C18 .....4.00
Monaca,Pa. S17 .....4.00
Newark,N.J. W18 .....4.40
Plymouth,Mich. P5 ....4.25
Pittsburgh J5 .....3.95
Putnam,Conn. W18 .....4.40
Readville,Mass. C14 ...4.40
St.Louis,Mo. M5 .....4.35
So.Chicago,Ill. W14 ....4.00
SpringCity,Pa.(5) K3 ..4.48
Struthers,O. Y1 .....4.00
Waukegan,Ill. A7 .....4.00
Youngstown F3, Y1 ...4.00

BAR SIZE ANGLES; S. SHAPES

Aliquippa,Pa. J5 .....3.35
Atlanta,Ga. A11 .....3.50
Bethlehem,Pa.(2) B2 ..3.55
Johnstown,Pa. B2 .....3.35
Lackawanna,N.Y. B2 ..3.35
Niles,Calif. P1 .....4.05
Pittsburgh(23) J5 .....3.35
Portland,Oreg. 04 .....4.10
SanFrancisco S7 .....4.05
Weirton,W.Va. W6 .....3.35

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. C3 .....4.00
Fontana,Calif. K1 .....4.75
Gary,Ind. C3 .....4.00
Youngstown C3 .....4.00

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy

Aliquippa,Pa. J5 .....5.10
Bessemer,Ala. T2 .....5.10
Bethlehem,Pa. B2 .....5.10
Clairton,Pa. C3 .....5.10
Cleveland R2 .....5.10
Ecorse,Mich. G5 .....5.30
Fairfield,Ala. T2 .....5.10
Fontana,Calif. K1 .....6.15
Gary,Ind. C3 .....5.10
Ind.Harbor,Ind. I-2, Y1..5.10
Johnstown,Pa. B2 .....5.10
Lackawanna,N.Y. B2 ..5.10
Pittsburgh J5 .....5.10
So.Duquesne,Pa. C3 ....5.10
Struthers,O. Y1 .....5.10
Youngstown C3 .....5.10

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 .....3.75
Buffalo R2 .....3.75
Canton,O. R2, T7 .....3.75
Clairton,Pa. C3 .....3.75
Ecorse,Mich. G5 .....4.05
Fontana,Calif. K1 .....4.75
Gary,Ind. C3 .....3.75
Houston,Tex. S5 .....4.15
Ind.Harbor,Ind. I-2, Y1..3.75
Johnstown,Pa. B2 .....3.75
KansasCity,Mo. S5 .....4.35
Lackawanna,N.Y. B2 ...3.75
LosAngeles B3 .....4.80
Massillon,O. R2 .....3.75
Midland,Pa. C18 .....3.75
S.Chicago C3, R2, W14..3.75
So.Duquesne,Pa. C3 ....3.75
Struthers,O. Y1 .....3.75
Warren,O. C17 .....3.75
Youngstown C3 .....3.75

BARS, Cold-Finished Alloy

Aliquippa,Pa. K5 .....4.65
Ambridge,Pa. W18 .....4.65
BeaverFalls,Pa. M12 ...4.65
Bethlehem,Pa. B2 .....4.65
Buffalo B5 .....4.65
Canton,O. R2, T7 .....4.65
Carnegie,Pa. C12 .....4.65
Chicago W18 .....4.65
Cleveland A7, C20 .....4.65
Donora,Pa. A7 .....4.65
Elyria,O. W8 .....4.65
Gary,Ind. R2 .....4.65
Hammond,Ind. L2, M13.4.65
Hartford,Conn. R2 .....4.95
Harvey,Ill. B5 .....4.65
Indianapolis M13 .....4.85
Lackawanna,N.Y. B2 ..4.65
Mansfield,Mass. B5 ....4.95
Massillon,O. R2, R8....4.65
Midland,Pa. C18 .....4.65
Monaca,Pa. S17 .....4.65
Newark,N.J. W18 .....4.95
So.Chicago,Ill. R2, W14.4.65
Struthers,O. Y1 .....4.65
Waukegan,Ill. A7 .....4.65
Worcester,Mass. A7 ....4.95
Youngstown F3, Y1 ....4.65

BARS, Reinforcing (Fabricators)

AlabamaCity,Ala. R2 ...3.35
Alton,Ill.(6) L1 .....3.35
Atlanta,Ga. A11 .....3.50
Buffalo R2 .....3.35
Cleveland R2 .....3.35
Emeryville,Calif. J7 ....4.10
Fairfield,Ala. T2 .....3.35
Fontana,Calif. K1 .....4.00
Gary,Ind. C3 .....3.35
Houston,Tex. S5 .....3.75
Ind.Harbor,Ind. I-2, Y1..3.35
Johnstown,Pa. B2 .....3.35
KarsasCity,Mo. S5 .....3.95
Lackawanna,N.Y. B2 ..3.35
LosAngeles B3 .....4.05
Minnequa,Colo. C10 ....4.25
Niles,Calif. P1 .....4.05
Pittsburg,Calif. C11 ....4.05
Pittsburgh J5 .....3.35
Portland,Oreg. O4 .....4.10
Seattle,Wash. B3, N14..4.10
So.Chicago,Ill. R2 .....3.35
So.Duquesne,Pa. C3 ...3.35
So.SanFrancisco B3 ....4.10
SparrowsPoint,Md. B2 ..3.35
Struthers,O. Y1 .....3.35
Torrance,Calif. C11 ....4.05
Youngstown C3, R2 ....3.35

BARS, Reinforcing (Fabricated; to Consumers)

Huntington,W.Va. W7 ..4.50
Johnstown,¼-1" B2 ....4.25
LosAngeles B3 .....5.00
Marion,O. P11 .....4.25
Pittsburgh J5 .....4.25
Seattle B3, N14 .....5.00
So.SanFrancisco B3 ....5.00
SparrowsPt.,1⅛-1¼" B2.4.83
SparrowsPt.,¼-1" B2 ...4.25

RAIL STEEL BARS

ChicagoHts.,Ill.(3) I-2..3.25
FortWorth,Tex.(4) T4 ..4.33
Hntngtn,W.Va.(3,4) W7.3.35
Moline,Ill.(3) R2 .....3.35
Williamsport(2,3) S19 ..3.35
Williamsport(4) S19 ....3.85

BARS, Wrought Iron

Economy,Pa.(S.R.)B14..9.50
Economy,Pa.(D.R.)B14.11.00
Economy(Stablt) B14 ..11.30
McK.Rks.(S.R.) L5 ....8.60
McK.Rks.(D.R.) L5 ...11.25
McK.Rks.(Staybolt) L5.12.75

BARS, Hot-Rolled Ingot Iron

Ashland,Ky.(17) A10 ..3.60

SHEETS, Hot-Rolled Steel (18 gage and heavier)

AlabamaCity,Ala. R2 ..3.25
Ashland,Ky.(8) A10 ...3.25
Butler,Pa. A10 .....3.25
Cleveland J5, R2 .....3.25
Conshohocken,Pa. A3 ..3.35
Ecorse,Mich.(8) G5 ....3.45
Fairfield,Ala. T2 .....3.25
Fontana,Calif. K1 .....4.15
Gary,Ind. C3 .....3.25
Ind.Harbor,Ind. I-2, Y1..3.25
Irvin,Pa. C3 .....3.25
Kokomo,Ind. C16 .....3.35
Lackawanna,N.Y. B2 ...3.25
Munhall,Pa. C3 .....3.25
Pittsburg,Calif. C11 ....3.95
Pittsburgh J5 .....3.25
Sharon,Pa. S3 .....3.25
So.Chicago,Ill. W14 ....3.25
SparrowsPoint,Md. B2 ..3.25
Steubenville,O. W10 ....3.25
Torrance,Calif. C11 ....3.95
Warren,O. R2 .....3.25
Weirton,W.Va. W6 .....3.25
Youngstown C3, Y1 ....3.25

SHEETS, Hot-Rolled Carbon Steel (19 gage and lighter)

AlabamaCity,Ala. R2 ...4.40
Dover,O. R1 .....5.00
Fairfield,Ala. T2 .....4.15
Ind.Harbor,Ind. I-2 ....4.15
Kokomo,Ind. C16 .....4.25
Mansfield,O. E6 .....4.15
Niles,O. N12, M4 .....4.15
Torrance,Calif. C11 ....5.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10 .....4.00
Cleveland J5 R2 .....4.00
Ecorse,Mich. G5 .....4.20
Fairfield,Ala. T2 .....4.00
Follansbee,W.Va. F4 ....4.00
Fontana,Calif. K1 .....4.90
Gary,Ind. C3 .....4.00
GraniteCity,Ill. G4 .....4.20
Ind.Harbor,Ind. I-2, Y1..4.00
Irvin,Pa. C3 .....4.00
Lackawanna,N.Y. B2 ...4.00
Middletown,O. A10 .....4.00
Pittsburg,Calif. C11 ....4.95
Pittsburgh J5 .....4.00
SparrowsPoint,Md. B2 ..4.00
Steubenville,O. W10 ....4.00
Warren,O. R2 .....4.00
Weirton,W.Va. W6 .....4.00
Youngstown Y1 .....4.00

SHEETS, Cold-Rolled, High-Strength Low-Alloy

Cleveland J5, R2 .....6.05
Ecorse,Mich. G5 .....6.25
Fontana,Calif. K1 .....6.95
Gary,Ind. C3 .....6.05
Ind.Harbor,Ind. I-2, Y1..6.05
Irvin,Pa. C3 .....6.05
Lackawanna,N.Y. B2 ...6.05
Pittsburgh J5 .....6.05
Sharon,Pa. S3 .....6.05
SparrowsPoint,Md. B2 ..6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 .....6.05
Youngstown Y1 .....6.05

SHEETS, H-R (14 ga., heavier) High-Strength Low-Alloy

Cleveland J5, R2	4.95
Conshohocken,Pa. A3	4.95
Ecorse,Mich. G5	5.15
Fairfield,Ala. T2	4.95
Fontana,Calif. K1	6.64
Gary,Ind. C3	4.95
Ind.Harbor,Ind. I-2, Y1	4.95
Irvin,Pa. C3	4.95
Lackawanna,N.Y. B2	4.95
Pittsburgh J5	4.95
Sharon,Pa. S3	4.95
So.Chicago,Ill. C3	4.95
SparrowsPoint,Md. B2	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	4.95
Youngstown C3, Y1	4.95

SHEETS, Gal'zd No. 10 Steel

AlabamaCity,Ala. R2	4.40
Ashland,Ky.(8) A10	4.40
Canton,O. R2	4.40
Delphos,O. N16	5.40
Dover,O. R1	5.40
Fairfield,Ala. T2	4.40
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Kokomo,Ind. C16	4.50
MartinsFerry,O. W10	4.40
Niles,O. N12	4.40
Pittsburg,Calif. C11	5.15
SparrowsPoint,Md. B2	4.40
Steubenville,O. W10	4.40
Torrance,Calif. C11	5.15
Weirton,W.Va. W6	4.40

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. C3	6.75
SparrowsPoint,Md. B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	4.95
Irvin,Pa. C3	4.95
Kokomo,Ind. C16	5.05
Niles,O. N12	4.95

SHEETS, Zincgrip No. 10

Butler,Pa. A10	4.65
Middletown,O. A10	4.65

SHEETS, Electro Galvanized

Cleveland R2	5.15
Niles,O. R2	5.15
Weirton,W.Va. W6	5.00

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.05

SHEETS, Culvert, No. 16 Flat

	Cu Alloy	Cu FE
Ashland A10	5.00	...
Canton,O. R2	5.05	5.50
Fairfield,Ala. T2	5.00	5.35
Gary C3	5.00	5.35
GraniteCity G4	5.40	5.70
Irvin C3	5.00	5.35
Kokomo C16	5.40	...
MartinsFy,O. W10	5.00	5.35
Pittsburg,Cal. C11	5.75	...
SparrowsPt. B2	5.00	...
Torrance,Cal. C11	5.75	...

SHEETS, Culvert, No. 16 Flat Ingot Iron

Ashland,Ky. A10	5.25

SHEETS, Well Casing

Torrance,Calif. C11	4.75
Youngstown C3	3.75

SHEETS, Aluminized

Butler,Pa. A10	7.75

SHEETS, Long Terne, Steel (No. 10; Commercial Quality)

BeechBotm.,W.Va. W10	4.80
Gary,Ind. C3	4.80
Mansfield,O. E6	4.80
Middletown,O. A10	4.80
Weirton,W.Va. W6	4.80

ROOFING SHORT TERNES (Package; 8 lb coated)

Gary,Ind. C3	$17.50
Yorkville, O. W10	17.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$6.75
Gary,Ind. C3	6.65
Ind.Harbor,Ind. I-2	6.65
Irvin,Pa. C3	6.65
Weirton,W.Va. W6	6.65
Yorkville,O. W10	6.65

SHEETS, Lt. Coated Ternes, 6 lb

Yorkville,O. W10	$7.20

SHEETS, Mfg. Ternes, 8 lb

Gary,Ind. C3	$8.10
Yorkville,O. W10	8.10

SHEETS, Coated Ternes, 12 lb

Gary,Ind. C3	8.95
Yorkville,O. W10	8.95

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.20

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.50
Cleveland R2	3.85
Ind.Harbor,Ind. I-2	3.50
Warren,O. R2	3.85

SHEETS, Cold-Rolled Ingot Iron

Cleveland R-2	4.60
Middletown,O. A10	4.50
Warren,O. R2	4.60

SHEETS, Galvanized Ingot Iron No. 10 Flat

Ashland,Ky.(8) A10	4.65
Canton,O. R2	5.15
Ind.Harbor,Ind. I-2	4.95

SHEETS, Zincgrip No. 10 Flat, Ingot Iron

Butler,Pa. A10	4.90
Middletown,O. A10	4.90

HOLLOWARE ENAMELING Black Plate (29 gage)

Aliquippa,Pa. J5	5.30
Follansbee,W.Va. F4	5.30
Gary,Ind. C3	5.30
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. C3	5.30
Niles,O. R2	5.30
SparrowsPoint,Md. B2	5.40
Warren,O. R2	5.30
Yorkville,O. W10	5.30

SHEETS, Enam'lg. Iron, No. 12

Ashland,Ky.(8) A10	4.40
Cleveland R2	4.40
Ecorse,Mich. G5	4.70
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Middletown,O. A10	4.40
Niles,O. M4	4.40
Youngstown Y1	4.40

CANMAKING BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$5.75
Fairfield,Ala. T2	5.85
Gary,Ind. C3	5.75
GraniteCity,Ill. G4	5.95
Ind.Harbor,Ind. I-2, Y1	5.75
Irvin,Pa. C3	5.75
Niles,O. R2	5.75
Pittsburg,Calif. C11	6.50
SparrowsPoint,Md. B2	5.85
Warren,O. R2	5.75
Weirton,W.Va. W6	5.75
Yorkville,O. W10	5.75

TIN PLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa J5	$7.50	$7.75
Fairfield,Ala. T2	7.60	7.85
Gary C3	7.50	7.75
Gran.City,Ill. G4	7.70	7.95
Ind.Harb. I-2, Y1	7.50	7.75
Irvin,Pa. C3	7.50	7.75
Pitts.,Cal. C11	8.25	8.50
Sp.Pt.,Md. B2	7.60	7.85
Warren R2	7.50	7.75
Weirton W6	7.50	7.75
Yorkville,O. W10.	7.50	7.75

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.50
Warren,O. R2	3.85

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	4.60

STRIP, Hot-Rolled Carbon

Alton,Ill.(1) L1	3.25
Ashland,Ky.(8) A10	3.25
Atlanta A11	3.40
Bessemer,Ala. T2	3.25
Bridgeprt,Conn.(10) S15	3.25
Butler,Pa. A10	3.25
Carnegie,Pa. S18	3.25
Cleveland J5	3.25
Detroit M1	3.45
Ecorse,Mich. G5	3.45
Fairfield,Ala. T2	3.25
Fontana,Calif. K1	4.40
Gary, Ind. C3	3.25
Houston,Tex. S5	3.65
Ind.Harbor,Ind. I-2, Y1	3.25
KansasCity,Mo.(9) S5	3.85
Lackawanna,N.Y. B2	3.25
LosAngeles B3	4.00
Milton,Pa. B6	3.25
Minnequa,Colo. C10	4.30
NewBritain(10) S15	3.25
N.Tonawanda,N.Y. B11	3.30
Pittsburg,Calif. C11	4.00
Pittsburgh J5	3.25
Riverdale,Ill. A1	3.25
SanFrancisco S7	4.00
Seattle B3, N14	4.25
Sharon,Pa. S3	3.25
So.Chicago,Ill. W14	3.25
So.SanFrancisco B3	4.00
SparrowsPoint,Md. B2	3.25
Torrance,Calif. C11	4.00
Warren,O. R2	3.25
Weirton,W.Va. W6	3.25
WestLeechburg,Pa. A4	3.25
Youngstown C3, Y1	3.25

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.10
Carnegie,Pa. S18	5.10
Fontana,Calif. K1	6.30
Gary,Ind. C3	5.10
Houston,Tex. S5	5.50
KansasCity,Mo. S5	5.70
NewBritn,Conn.(10) S15	5.10
Sharon,Pa. S3	5.10
Youngstown C3	5.10

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15	9.50
Carnegie,Pa. S18	9.50
Cleveland A7	9.50
Dover,O. G6	9.50
Harrison,N.J. C18	9.80
NewBritn,Conn.(10) S15	9.50
Pawtucket,R.I.(11) N8	9.50
Pawtucket,R.I.(12) N8	9.80
Sharon,Pa. S3	9.50
Worcester,Mass. A7	9.80
Youngstown C8	9.50

STRIP, Cold-Rolled Carbon

Berea,O. C7	6.10
Bridgeprt,Conn.(10) S15	4.00
Butler,Pa. A10	4.00
Chicago,Ill. T6	4.15
Cleveland A7, J5	4.00
Detroit D2, D3	4.25
Detroit M1	4.20
Dover,O. G6	4.00
Ecorse,Mich. G5	4.20
Follansbee,W.Va. F4	4.00
Fontana,Calif. K1	4.90
Ind.Harbor,Ind. I-2	4.00
Lackawanna,N.Y. B2	4.00
LosAngeles C1	5.00
Mattapan,Mass.(21) T6	4.50
Middletown,O. A10	4.00
NewBritain(10) S15	4.00
New Castle, Pa. B4, E5	4.00
NewHaven,Conn. A7, D2	4.50
NewKensington,Pa. A6	4.00
NewYork W3	5.00
Pawtucket,R.I.(11) N8	4.55
Pawtucket,R.I.(21) N8	4.50
Pawtucket,R.I. R3	4.50
Pittsburgh J5	4.00
Riverdale,Ill. A1	4.15
Sharon,Pa. S3	4.00
SparrowsPoint,Md. B2	4.00
Trenton,N.J.(13) R5	5.00
Wallingford,Conn. W2	4.50
Warren,O. R2, T5	4.00
Weirton,W.Va. W6	4.00
Youngstown C8, Y1	4.00

STRIP, Cold-Rolled, High-strength Low-Alloy

Cleveland A7, J5	6.05
Dover,O. G6	6.05
Ecorse,Mich. G5	6.25
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.05
Pittsburgh J5	6.05
Sharon,Pa. S3	6.05
SparrowsPoint,Md. B2	6.05
Warren,O. R2	6.05
Weirton,W.Va. W6	6.05
Youngstown Y1	6.05

STRIP, Electro Galvanized

Weirton,W.Va. W6	4.00
Youngstown C8	4.00

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$6.45	$6.70	$7.00
Fairfield,Ala. T2	6.55	6.80	7.10
Gary,Ill. C3	6.45	6.70	7.00
GraniteCity,Ill. G4	6.65	6.90	7.20
Ind.Harbor,Ind. I-2, Y1	6.45	6.70	7.00
Irvin,Pa. C3	6.45	6.70	7.00
Niles,O. R2	6.45	6.70	7.00
Pittsburg,Calif. C11	7.20	7.45	7.75
SparrowsPoint,Md. B2	6.55	6.80	7.10
Weirton,W.Va. W6	6.45	6.70	7.00
Yorkville,O. W10	6.45	6.70	7.00

SHEET SILICON (24 Gage Base)

	Field	Arm.	Elec.	Motor	Dyn.
BeechBottom,W.Va. W10	...	5.45	5.95	6.70	7.50
Brackenridge,Pa. A4	...	...	5.95	6.70	7.50
Follansbee,W.Va. F4	...	5.45	5.95	6.70	7.50
GraniteCity,Ill. G4	...	...	6.15	6.90	7.70
Ind.Harbor,Ind. I-2	5.15	5.45	5.95	...	...
Mansfield,O. E6	5.15	5.45	5.95	6.70	...
Niles,O. M4	5.15	5.45	5.95	...	...
Niles,O. N12	...	5.45	5.95	...	...
Toronto,O. F4	...	5.45	5.95	6.70	7.50
Vandergrift,Pa. C3	...	5.45	5.95	6.70	7.50
Warren,O. R2	...	5.45	5.95	6.70	...
Zanesville,O. A10	...	5.45	5.95	6.70	7.50

COILS AND CUT LENGTHS, Cold-Rolled, Silicon

	Field	Arm.	Elec.	Motor	Dyn.
Vandergrift,Pa. C3	...	5.70	6.20	6.95	7.75
Warren,O. R2	5.40	5.70	6.20	6.95	7.75

SHEETS, Silicon Transformer Grade

	72	65	58	52
BeechBottom,W.Va. W10	8.05	8.60	9.30	10.10
Brackenridge,Pa. A4	8.05	8.60	9.30	....
Follansbee,W.Va. F4	8.05	8.60	9.30	10.10
Toronto,O. F4	8.05	8.60	9.30	10.10
Vandergrift,Pa. C3	8.05	8.60	9.30	10.10
Zanesville,O. A10	8.05	8.60	9.30	10.10

COLD-REDUCED COILS and Cut Lengths, Silicon

	72	T-100	T-90	T-80
Butler,Pa. A10	...	12.35	13.60	14.85
Vandergrift,Pa. C3	8.30	11.35	12.60	13.85
Warren,O. R2	8.30	....	....	....

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.25-0.40C	0.40-0.60C	0.60-0.80C	0.80-1.05C	1.05-1.35C
Bridgeprt,Conn.(10) S15	4.00	5.50	6.10	8.05	10.35
Bristol,Conn. W1	...	...	6.40	8.35	....
Carnegie,Pa. S18	...	5.50	6.10	8.05	10.35
Chicago T6	4.25	5.65	6.25	8.20	10.50
Cleveland A7	4.00	5.50	6.10	8.05	10.35
Dover,O. G6	4.00	5.50	6.10	7.85	10.15
Harrison,N.J. C18	...	...	6.40	8.35	10.65
Mattapan,Mass. T6	4.50	5.80	6.40	8.35	10.65
NewBritn.,Conn.(10) S15	4.00	5.50	6.10	8.05	10.35
NewCastle,Pa. B4	4.00	5.50	6.10	...	....
NewYork W3	...	5.80	6.40	8.35	10.65
Pawtucket,R.I. N8 Cleve.orPitts.Base	4.55	5.50	6.10	8.05	10.35
Worcester,Mass.Base	4.50	5.80	6.40	8.35	10.65
Sharon,Pa. S3	4.00	5.50	6.10	8.05	10.35
Trenton,N.J. R5	...	6.30	6.90	8.85	11.15
Union,N.J. H6	4.40	6.35	6.35	8.30	10.50
Wallingford,Conn. W2	4.50	5.80	6.40	8.05	10.35
Weirton,W.Va. W6	4.00	5.50	6.10	8.05	10.35
Worcester,Mass. A7	4.30	5.80	6.40	8.35	10.65
Worcester,Mass. T6	4.50	5.80	6.40	8.35	10.65
Youngstown C8	4.50	5.50	6.10	8.05	10.35

Key to Producing Companies

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A6 American Shim Steel Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bolardi Steel Corp.
B8 Braeburn Alloy Steel Co.
B11 Buffalo Bolt Co.
B14 A. M. Byers Co.

C1 Calif. Cold-Rolled Steel
C3 Carnegie-Illinois Steel
C4 Carpenter Steel Co
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cld. Roll. Mills Co.
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Col. Steel & Shafting Co.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel Co.
D4 Disston & Sons, Henry

E1 Eastrn. Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Co.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F6 Fretz-Moon Tube Co.

G1 Geneva Steel Co.
G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H4 Heppenstall Co.
H6 Hind Steel Co. Inc.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J7 Judson Steel Corp.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K5 Kidd Drawn Steel Co.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.

STRIP, Hot-Rolled, High-Strength Low-Alloy

Bessemer,Ala. T2	4.95
Cleveland J5	4.95
Ecorse,Mich. G5	5.15
Fairfield,Ala. T2	4.95
Fontana,Cal. K1	6.64
Gary,Ind. C3	4.95
Ind Harb,Ind. I-2, Y1	4.95
Lackawanna,N.Y. B2	4.95
Pittsburgh J5	4.95
Sharon,Pa. S3	4.95
SparrowsPoint,Md. B2	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	4.95
Youngstown C3, Y1	4.95

TIGHT COOPERAGE HOOP

Atlanta A11	3.60
Riverdale,Ill. A1	3.60
Sharon,Pa. S3	3.60
Youngstown C3	3.60

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	5.55
Alton,Ill(1) L1	5.55
Bartonville,Ill.(19) K4	5.55
Buffalo W12	5.55
Cleveland A7	5.55
Donora,Pa. A7	5.55
Duluth A7	5.55
Fostoria,O. S1	6.05
Johnstown,Pa. B2	5.55
LosAngeles B3	6.50
Monessen,Pa. P7	5.55
Palmer,Mass. W12	5.85
Pittsburg,Calif. C11	6.50
Portsmouth,O. P12	5.55
So.Chicago,Ill. R2	5.55
SparrowsPoint,Md. B2	5.65
Struthers,O. Y1	5.55
Trenton,N.J. A7	5.85
Trenton,N.J. R5	6.35
Waukegan,Ill. A7	5.55
Worcester A7,J4,T6,W1	5.85

WIRE, Cold-Rolled Flat

Chicago T6	5.35
Cleveland A7	5.00
Dover,O. G6	5.00
Fostoria,O. S1	5.50
Kokomo,Ind. C16	5.00
Massillon,O. R8	5.00
Monessen,Pa. P7	5.00
Pawtucket,R.I.(11) N8	5.55
Pawtucket,R.I.(12) N8	5.50
Trenton,N.J. R5	5.80
Worcester,Mass. A7	5.30
Worcester,Mass. T6	5.30

WIRE, Fine and Weaving (8-in. Coils)

Bartonville,Ill.(19) K4	7.70
Chicago W13	7.70
Cleveland A7	7.70
Fostoria,O. S1	7.70
Johnstown,Pa. B2	7.70
Kokomo,Ind. C16	7.70
Portsmouth,O. P12	7.70
Struthers,O. Y1	7.70
Trenton,N.J. R5	8.50
Waukegan,Ill. A7	7.70
Worcester,Mass. A7, T6	8.00

WIRE, Manufacturers Bright, Low-Carbon

AlabamaCity,Ala. R2	4.15
Aliquippa,Pa. J5	4.15
Alton,Ill.(1) L1	4.15
Bartonville,Ill.(1) K4	4.15
Buffalo W12	4.15
Chicago W13	4.15
Cleveland A7, C20	4.15
Crawfrdsvll,Ind. M8	4.30
Donora,Pa. A7	4.15
Duluth A7	4.15
Fairfield,Ala. T2	4.15
Fostoria,O.(24) S1	4.50
Houston S5	4.55
Johnstown,Pa. B2	4.15
Joliet,Ill. A7	4.15
KansasCity,Mo. S5	4.75
Kokomo,Ind. C16	4.25
LosAngeles B3	5.10
Millbury,Mass.(12) N6	4.45
Minnequa,Colo. C10	4.50
Monessen,Pa. P7	4.15
Newark,6-8ga. I-1	4.75
No.Tonawanda B11	4.18
Palmer,Mass. W12	4.45
Pittsburg,Calif. C11	5.10
Portsmouth,O. P12	4.15
Rankin,Pa. A7	4.15
So.Chicago,Ill. R2	4.15
So.SanFrancisco C10	5.10
SparrowsPoint,Md. B2	4.25
Sterling,Ill.(1) N15	4.15
Struthers,O. Y1	4.15
Torrance,Calif. C11	5.10
Waukegan,Ill. A7	4.15
Worcester,Mass. A7,T6	4.45

WIRE (16 gage)

	An'ld. Stone	Galv.
Aliquippa J5	9.05	10.55
Bartnvill(19) K4	9.05	10.55
Cleveland A7	9.05	10.55
Fostoria,O. S1	9.15	10.65
Johnstown B2	9.05	10.55
Kokomo C16	9.05	10.10
Minnequa C10	9.40	10.90
Pitts,Cal. C11	9.40	10.90
Prtsmth.(18) P12	9.05	10.55
SparrowsPt., B2	9.15	10.65
Struthers Y1	9.05	10.55
Waukegan A7	9.05	10.55

WIRE, Merchant Quality (6 to 8 gage)

	An'ld.	Galv.
Ala.City, R2	4.80	5.25
Aliquippa J5	4.80	5.25
Atlanta A11	*4.90*	*5.35*
Bartnville.(19) K4	4.80	5.25
Cleveland A7	4.80	5.25
Crawfrdvll. M8	4.95	5.40
Donora A7	4.80	5.25
Duluth A7	4.80	5.25
Fairfield T2	4.80	5.25
Houston,Tex. S5	5.20	5.65
Johnstown B2	4.80	5.25
Joliet,Ill. A7	4.80	5.25
KansasCity,Mo. S5	5.40	5.85
Kokomo C16	4.90	5.35
LosAngeles B3	5.75	...
Minnequa C10	5.15	5.60
Monessen P7	4.80	5.25
Pitts.Cal. C11	5.75	6.20
Portsmth.(18) P12	4.80	5.25
Rankin A7	4.80	5.25
So.Chicago R2	4.80	5.25
So.S.Fran. C10	5.75	6.20
SparrowsPt, B2	4.90	5.35
Sterling,Ill.(1) N15	4.80	5.25
Struthers,O. Y1	4.80	5.25
Torrance,Cal. C11	5.75	...
Worcester A7	5.10	5.55

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.20
Alton,Ill.(1) L1	5.20
Cleveland A7	5.20
Donora,Pa. A7	5.20
Duluth A7	5.20
Johnstown,Pa. B2	5.20
LosAngeles B3	6.15
NewHaven,Conn. A7	5.50
Pittsburg,Calif. C11	6.15
Portsmouth,O. P12	5.20
So.Chicago,Ill. R2	5.20
SparrowsPoint,Md. B2	5.30
Struthers,O. Y1	5.20
Torrance,Calif. C11	6.15
Trenton,N.J. A7	5.50
Waukegan,Ill. A7	5.20
Worcester,Mass. A7	5.50

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	123
Aliquippa,Pa. J5	123
Atlanta A11	125
Bartonville,Ill.(19) K4	123
Crawfordsville M8	126
Donora,Pa. A7	123
Duluth,Minn. A7	123
Fairfield,Ala. T2	123
Houston,Tex. S5	131
Johnstown,Pa. B2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	130
Monessen,Pa. P7	123
Pittsburgh,Calif. C11	143
Portsmouth,O.(18) P12	123
Rankin,Pa. A7	123
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	143
SparrowsPoint,Md. B2	125
Sterling,Ill(1) N15	123

FENCE POSTS

	Col.
Duluth A7	112
Huntington,W.Va. W7	112
Johnstown,Pa. B2	112
Joliet,Ill. A7	112
Minnequa,Colo. C10	120
Moline,Ill. R2	116
Williamspt,Pa., S19..n.t.	$120

WOVEN FENCE, 9-15½ gage

	Col.
Ala.City,Ala.,17-18ga. R2	175
AlabamaCity,Ala. R2	109
Aliquip.,Pa.9-14½ga. J5	109
Atlanta A11	111
Bartonville,Ill.(19) K4	109
Crawfordsvll,Ind. M8	112
Donora,Pa. A7	109
Duluth A7	109
Houston,Tex. S5	117
Fairfield,Ala. T2	109
Johnstown,Pa. B2	109
Johnstn,17ga.,6" B2	183
Johnstn,17ga.,4" B2	186
Joliet,Ill. A7	109
KansasCity,Mo. S5	121
Kokomo,Ind. C16	111
Minnequa,Colo. C10	116
Monessen,Pa. P7	109
Pittsburg,Calif. C11	132
Portsmouth,O.(18) P12	109
Rankin,Pa. A7	109
So.Chicago,Ill. R2	109
Sterling,Ill.(1) N15	109

BALE TIES, Single Loop

	Col.
AlabamaCity, Ala. R2	106
Atlanta A11	107
Bartonville,Ill.(19) K4	106
Chicago W13	106
Crawfordsville M8	109
Donora,Pa. A7	106
Duluth A7	106
Fairfield,Ala. T2	106
Joliet,Ill. A7	106
Kokomo,Ind. C16	108
Minnequa, Colo. C10	113
Pittsburg,Calif. C11	130
Portsmouth,O.(18) P12	106
So.Chicago,Ill. R2	106
So.SanFran.,Calif. C10	130
SparrowsPoint,Md. B2	108
Sterling,Ill.(1) N15	106

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	5.20
Bartonville,Ill.(19) K4	5.20
Donora,Pa. A7	5.20
Duluth A7	5.20
Johnstown,Pa. B2	5.20
Joliet,Ill. A7	5.20
Kokomo,Ind. C16	5.30
Minnequa, Colo. C10	5.55
Pittsburg,Calif. C11	6.15
Portsmouth,O. P12	5.20
Rankin,Pa. A7	5.20
So.Chicago,Ill. R2	5.20
SparrowsPoint,Md. B2	5.30
Worcester,Mass. A7	5.50

NAILS & STAPLES, Stock (To Dealers & Mfrs.)

AlabamaCity,Ala. R2	103
Aliquippa,Pa. J5	103
Atlanta A11	105
Bartonville,Ill.(19) K4	103
Cleveland A9	110
Crawfordsville M8	106
Donora,Pa. A7	103
Duluth A7	103
Fairfield,Ala. T2	103
Houston,Tex. S5	111
Johnstown,Pa. B2	103
Joliet,Ill. A7	103
KansasCity,Mo. S5	115
Kokomo,Ind. C16	105
Minnequa, Colo. C10	110
Monessen,Pa. P7	103
Pittsburg,Calif. C11	122
Portsmouth,O. P12	103
Rankin,Pa. A7	103
So.Chicago,Ill. R2	103
SparrowsPoint,Md. B2	105
Sterling,Ill.(1) N15	103
Torrance,Calif. C11	123
Worcester,Mass. A7	109

NAILS & STAPLES, Stock (To Jobbers)

	Col.
Chicago,Ill. W13	103
Minnequa,Colo. C10	107
Portsmouth,O. P12	100

NAILS, Cut (100 lb keg)

Conshohoken,Pa. A3	$6.75
Wheeling,W.Va. W10	6.75

AXLES

Fairfield,Ala. T2	5.20
Gary,Ind. C3	5.20
Ind.Harbor,Ind. S13	5.20
Johnstown,Pa. B2	5.20
McKeesRocks,Pa. C3	5.20

TIE PLATES

Fairfield,Ala. T2	4.05
Gary,Ind. C3	4.05
Ind.Harbor,Ind. I-2	4.05
Lackawanna,N.Y. B2	4.05
Minnequa,Colo. C10	4.05
Pittsburg,Calif. C11	4.20
Pittsburgh R2	4.05
Seattle B3	4.50
Steelton,Pa. B2	4.05
Torrance,Calif. C11	4.20
Weirton,W.Va. W6	4.05

JOINT BARS

Bessemer,Pa. C3	4.25
Fairfield,Ala. T2	4.25
Ind.Harbor,Ind. I-2	4.25
Joliet,Ill. C3	4.25
Lackawanna,N.Y. B2	4.25
Minnequa,Colo. C10	4.25
Steelton,Pa. B2	4.25

TRACK BOLTS

	(20) Treated
Fairfield,Ala. T2	8.50
Lebanon,Pa. B2	8.50
Minnequa,Colo. C10	8.25
Pittsburgh,Pa. O3, P14	8.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	5.35
Ind.Harbor,Ind. I-2, Y1	5.35
Lebanon,Pa. B2	5.35
Minnequa, Colo. C10	5.35
Pittsburgh J5	5.35
So.Chicago,Ill. R2	5.35
Struthers,O. Y1	5.35
Youngstown R2	5.35

LIGHT RAILS, Rail Steel

Huntington,W.Va. W7	3.55
Williamsport,Pa. S19	3.55

ROPE WIRE

	Mild Plow	Plow	Imp. Plow
Bartonville,Ill. K4	7.10	7.40	7.80
Cleveland A7	7.50	7.80	8.20
Donora,Pa. A7	7.50	7.80	8.20
Fostoria,O. S1	8.00	8.30	8.70
Johnstown,Pa. B2	7.50	7.80	8.20
Monessen,Pa. P7	7.50	7.80	8.20
NewHaven,Conn. A7	7.80	8.10	8.50
Portsmouth,O. P12	7.50	7.80	8.20
SparrowsPoint,Md. B2	7.60	7.90	8.30
Struthers,O. Y1	7.50	7.80	8.20
Trenton,N.J. A7	7.80	8.10	8.50
Trenton,N.J. R5	8.00	8.30	8.70
Waukegan,Ill. A7	7.50	7.80	8.20
Williamsport,Pa. B2	7.60	7.90	8.30
Worcester,Mass. J4	7.50	7.80	8.20

RAILS

	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb. Under
Bessemer,Pa. C3	3.20	3.10	3.15	3.55
Ensley,Ala. T2	3.20	3.10	3.15	3.55
Fairfield,Ala. T2	...	...	...	3.55
Gary,Ind. C3	3.20	3.10	3.15	...
Ind.Harbor,Ind. I-2	3.20	3.10	3.15	...
Johnstown,Pa. B2	...	...	...	(16) 3.55
Lackawanna B2	3.20	3.10	...	3.55
Minnequa,Colo. C10	3.20	3.10	...	4.25
Steelton,Pa. B2	3.20	3.10	...	...

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	19.00	18W,4Cr,3V	114.50
Extra Carbon	22.00	18W,4Cr,2V,9Co	168.50
Spec. Carbon	26.50	18W,4Cr,2V,6Co	154.00
Oil Hardening	29.00	18.25W,4.25Cr,1V,4.75Co	142.00
Hi.-Carbon-Cr	52.00	20.25W,4.25Cr,1.6V,12.25Co	266.50
Cr Hot Wrk	29.00	1.5W,4Cr,1V,8.5Mo	65.00
18W,4Cr,1V	90.50	6.4W,4.5Cr,1.9V,5Mo	69.50
18W,4Cr,2V	102.50	6W,4Cr,3V,6Mo	88.00

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M9, R2, S8, T7, U4, V2, V3.

Key to Producing Companies

L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M10 Missouri-Illinois Furnace
M12 Moltrup Steel Products
M13 Monarch Steel Co.

N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 New Eng.High Carb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P5 Pilgrim Drawn Steel Crp.
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R7 Rotary Electric Steel Co.
R8 Reliance Div., Eaton Mfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.

T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San. Corp.

U4 Universal Cyclops Steel

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 Wstrn.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Co.
W15 Woodward Iron Co.
W16 Worth Steel Co.
W18 Wyckoff Steel Co.

Y1 Youngstwn. Sheet & Tube

(1) Chicago Base. (2) Angles.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. Base.
(8) 16 gage and heavier.
(9) 6" and narrower.
(10) Pittsburgh Base.
(11) Cleveland & Pittsburgh Base.
(12) Worcester, Mass. Base.
(13) 3" & wider; over ½" to under 3" 5.50c.
(14) Also wide flange beams.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh Base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. Base.
(22) Del. San Fran. Bay area.
(23) Angles 1"x1" to 1¼"x1¼" only.
(24) Deduct 0.35c for finer than 15 Ga.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	41.5	39.5	38.5	13.5	11.5	10.5
¼	6.0	0.42	39.5	37.5	36.5	15.5	13.5	12.5
⅜	6.0	0.57	36	34	33	12.5	10.5	9.5
½	8.5	0.85	43	41	42	26.5	24.5	25.5
¾	11.5	1.13	46	44	45	30.5	28.5	29.5
1	17.0	1.68	48.5	46.5	47.5	33.5	31.5	32.5
1¼	23.0	2.28	49	47	48	34	32	33
1½	27.5	2.73	49.5	47.5	48.5	34.5	32.5	33.5
2	37.0	3.68	50	48	49	35	33	34
2½	58.5	5.82	50.5	48.5	49.5	35.5	33.5	34.5
3	76.5	7.62	50.5	48.5	49.5	35.5	33.5	34.5

Column A: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va. 1½ percentage point lower on ⅛", 2 points lower on ¼", 3 points lower ⅜", W10; Wheatland, Pa., 2 points lower on ⅛ through ⅜", W9. Following make ½ through 3" only: Lorain, O. N3; Youngstown R2, Y1; Aliquippa, Pa. J5. Fontana, Calif., K1 quotes 11 points lower on ½" through 3".

Columns B & E: Sparrows Point, Md. B2; Wheatland, Pa., ⅛ through ⅜", W9.

Columns C & F: Alton, Ill. (Lorain, O. Base) LI; Indiana Harbor, Ind., ½ through 3", Y1.

Column D: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa., ⅛ through ⅜", F6; Benwood, W. Va., except 3½ points lower on ⅛", 2½ pts on ¼", 3 pts on ⅜" W10; Wheatland, Pa., except 2 pts lower on ⅛ through ⅜" W9. Following make ½ through 3" only; Lorain N3; Youngstown R2, Y1; Aliquippa, Pa. J5. Fontana, Calif., K1 quotes 11 points lower on ½" through 3".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	38.5	23	38.5	23
2½	58.5	5.82	41.5	26	41.5	26
3	76.5	7.62	41.5	26	41.5	26
3½	92.0	9.20	43.5	28	43.5	28
4	$1.09	10.89	43.5	28	43.5	28
5	1.48	14.81	43.5	28	43.5	28
6	1.92	19.18	43.5	28	43.5	28

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5; Lorain, O. N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 4 to 24 in., inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	11.50	13.39	13.00	13.00
1¼	13	13.62	15.87	13.21	15.39
1½	13	15.05	17.71	14.60	17.18
1¾	13	17.11	20.15	16.60	19.54
2	13	19.18	22.56	18.60	21.89
2¼	13	21.37	25.16	20.73	24.40
2½	12	23.54	27.70	22.83	26.88
2½	12	25.79	30.33	25.02	29.41
2¾	12	27.33	32.14	26.51	31.18
3	12	28.68	33.76	27.82	32.74
3¼	11	33.39	39.29	32.39	38.11
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78
4½	9	58.99	69.42	....	....
5	9	68.28	80.35	....	....
6	7	104.82	123.33	....	....

Boiler tube producers include Babcock & Wilcox Tube Co., National Tube Co., Globe Steel Tubes Co., Pacific Tube Co., Pittsburgh Steel Co., Republic Steel Corp., Standard Tube Co.

BOLTS, NUTS

(To consumers)

F.o.b. midwestern plants. Additional discounts on carriage, machine bolts, 5 for cl; 15 for full containers, except tire and plow bolts.

CARRIAGE, MACHINE BOLTS

(Per cent off list)

½-in., smaller; up to 6 in. long 35
⅝ & ¾ x 6 in., shorter. 37
⅞-in. & larger x 6 in., shorter 34
All diameters longer than 6-in. 30
Tire bolts 25
Plow bolts 47
Lag bolts, 6 in., shorter 37
Lag bolts, longer than 6 in. 35

NUTS

Semifinished hexagon	A.S. Reg. & Light	Heavy
⅞-in., smaller	41 off	.....
½-in., smaller	....	38 off
½-in.-1-in.	....39 off	.....
⅞-in.-1-in.	....	37 off
1⅛-in.-1½-in.	.37 off	35 off
1⅝-in., larger	..34 off	28 off

Additional discount of 15 for full containers.

STOVE BOLTS

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

SQUARE HEAD SET SCREWS

Upset 1-in. & smaller..51 off
¾, ⅞, & 1 x 6-in. & shorter .....35 off
Headless, ¼-in., larger..31 off

HEXAGON CAP SCREWS

(Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright) ..... 46 off
Upset (1035 heat treated) ⅝ and smaller x 6 and shorter ..... 40 off

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger 6.75c
⅞-in.,* under .....48 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers .....Net to $1 off

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	37.50	30.50	28.50
302...	37.50	33.00	28.50
303...	39.50	36.50	31.00
304...	39.50	35.00	30.00
309...	52.00	52.00	41.50
316...	53.00	55.00	46.00
321...	45.50	44.50	34.00
347...	50.00	48.50	38.50
410...	33.00	27.00	23.00
416...	33.50	33.50	23.50
420...	40.50	43.50	28.50
430...	35.50	27.50	23.50
501...	24.00	22.50	11.50
502...	25.00	23.50	12.50

Baltimore, Types 301 through 347 sheets, except 309 E2
Baltimore, bars, wire and structurals A10
Brackenridge, Pa., sheets A4
Bridgeville, Pa., bars, wire, sheets & strip, except Type 309 strip quoted 51.00c U4
Butler, Pa., sheets and strip except Types 309, 501 & 502 A10
Carnegie, Pa., strip except Type 416; Type 309 strip quoted 51.00c S18
Cleveland, strip, except Type 309 quoted 51.00c, and except Type 416 A7
Detroit, strip, except Type 309 quoted 51.00c M1
Dunkirk, N.Y., bars, wire A4
Duquesne, Pa., bars C3
Gary, Ind., sheets except Type 416 C3
Harrison, N. J., strip C18
Massillon, all products, except Type 309 bars, wire & structurals quoted 42.00c, Type 501 10.50c, Type 502 11.50c R2
McKeesport, Pa., bars; sheets except Type 416, C3
McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2
Middletown, O., sheets and strip, except Types 501 and 502 and except 309 strip quoted 51.00c A10
Midland, sheets & strip C18
Munhall, Pa., bars C3
Pittsburgh, sheets C18
Reading, Pa., bars & strip except Type 309 bars quoted 42.00c C4
So. Chicago, Ind., bars & structurals C3
Syracuse, N. Y., bars, wire & structurals C18
Titusville, Pa., bars U4
Wallingford, Conn., strip W2
Washington, Pa., bars, sheets & strip except Type 309 strip quoted 51.00c J3
Washington, Pa., Types 301 through 347 sheets & strip except 303 & 309; 316 sheets 58.00c strip 60.00c W4
Watervliet, N. Y., structurals & bars A4
Waukegan, bars & wire A7
West Leechburg, Pa., strip, except Type 309 quoted 51.00c A4
Youngstown, strip C8.

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Diam.	Inches Length	Cents per lb.
17,18,20	60,72	16.00
8 to 16	48,60,72	16.50
7	48,60	17.75
6	48,60	19.00
4,5¼	40	19.50
3	40	20.50
2½	24,30	21.00
2	24,30	23.00
	CARBON	
40	100,110	7.50
35	100,110	7.50
30	84,110	7.50
24	72 to 104	7.50
17 to 20	84,90	7.50
14	60,72	8.00
10,12	60	8.25

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.

Imported, net ton, duty paid, metallurgical grade, $39-$40.

REFRACTORIES

(Prices per 1000 brick, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $100. Hardfired, $135 at above points.

High-heat Duty: Salina, Pa. $85; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $80.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., Ottawa, Ill., $66.

LADLE BRICK

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa., Chester, New Cumberland, W.Va.; Irondale, Wellsville, O.

Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

MALLEABLE BUNG BRICK

St. Louis, Mo., Olive Hill, Ky., Ottawa, Ill., $90; Beach Creek, Pa., $80.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa., $85; Joliet or Rockdale, Ill., E. Chicago, Ind., $89; Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., Birmingham, $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $81.

BASIC BRICK

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, $66; Chemical - ponded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

MAGNESITE

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead - burned, ⅝" grains; Bulk, $30.50-$31.00; single paper bags, $35.00-$35.50.

DOLOMITE

(Base prices per net ton)

Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

COAL CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 20.00
Toluol, one deg. ..19.00-23.50
Industrial xyiol ..20.50-26.50

Per ton bulk, ovens

Sulphate of ammonia $45.00

Per pound, ovens

Phenol, 40 (carlots, returnable drums) 13.25
Do., less than carlots..14.00
Do., tank cars 12.50

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports. Any increase or decrease in R.R. freight rates, dock handling charges and taxes thereon are for buyer's account.

Old range bessemer ...$7.60
Old range nonbessemer. 7.45
Mesabi bessemer 7.35
Mesabi nonbessemer ..7.20
High phosphorus 7.20

EASTERN LOCAL ORE

Cents, unit, del. E. Pa.

Foundry and basic 56.62% concentrates, contract .16.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:
Spot: 17.00
Long-term contract..15.00
Brazil iron ore, 68-69% .19.50

TUNGSTEN ORE

Wolframite, scheelite, net ton unit, duty pd.. $20-$22

MANGANESE ORE

Long term contracts, nominal; nearby, 48%, duty paid, 81.8c-83.8c per long ton unit, c.i.f. U.S. ports; prices on lower grades adjusted to Mn content and impurities.

CHROME ORE

Gross ton f.o.b. cars, new York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African
48% 2.8:1 .....$35.00
48% 3:1 ..... 37.50
48% no ratio.....28.50-29.00
South African Transvaal
44% no ratio....$19.00-20.00
45% no ratio.....19.50-21.00
48% no ratio.....27.00-28.00
50% no ratio.....28.50-29.00
Brazilian
44% 2.5:1 lump.....$32.00
Rhodesian
45% no ratio....$20.00-21.00
48% no ratio.....28.00-29.00
48% 3:1 lump 37.50
Domestic—rail nearest seller
48% 3:1 .....$39.00

MOLYBDENUM

Sulphide conc., lb, Mo, cont. Mines $0.90

METALLURGICAL COKE

Price per Net Ton

BEEHIVE OVENS

Connellsvll, fur..$13.00-13.50
Connellsvll, fdry. 15.50-16.00
New River, foundry ...18.00
Wise county, foundry..15.35
Wise county, furnace..14.60

OVEN FOUNDRY COKE

Kearny, N. J., ovens..$22.00
Everett, Mass., ovens ....
New England, del.‡..22.70
Chicago, ovens 20.00
Chicago, del. .....†21.45
Detroit, del. 23.91
Terre Haute, ovens...20.20
Milwaukee, ovens 20.75
Indianapolis, ovens 19.85
Chicago, del. 23.32
Cincinnati, del. 22.77
Detroit, del. 23.75
Ironton, O., ovens 19.40
Cincinnati, del. 21.63
Painesville, O., ovens..20.90
Buffalo, del. 23.02
Cleveland, del. 22.62
Erie, del. 21.04
Birmingham, ovens 17.70
Philadelphia, ovens 20.45
Swedeland, Pa., ovens..20.40
Portsmouth, O., ovens..19.50
Detroit, ovens 20.65
Detroit, del. *21.70
Buffalo, del. 22.95
Flint, del. 23.00
Pontiac, del. 21.98
Saginaw, del. 23.30

Includes representative switching charge of: *, $1.05; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡Or within $4.03 freight zone from works.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R. 15 Ga.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York (city)	5.60	6.51	7.10	5.82	...	5.77	6.31	8.28	5.53	5.85	7.36
New York(c'try)	5.40	6.31	6.90	5.62	...	5.57	6.11	8.08	5.33	5.65	7.16
Boston (city) ..	5.75	6.75**	7.16	5.80	...	5.72	6.22	8.77	5.62	5.95	7.45
Boston (c'try) .	5.55	6.55**	6.96	5.60	...	5.52	6.02	8.57	5.42	5.75	7.25
Phila. (city)...	5.90	6.49	6.88	5.65	...	5.65	6.21	8.10	5.35	5.60	6.80
Phila. (c'try) ..	5.65	6.24	6.63	5.40	...	5.40	5.96	7.85	5.10	5.35	6.55
Balt. (city)....	5.46	6.36	6.81	5.52	...	5.57	6.05	...	5.51	5.71	7.16
Balt. (c'try)...	5.31	6.21	6.66	5.37	...	5.42	5.91	...	5.36	5.56	7.01
Norfolk, Va. ..	5.80‡	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
Wash. (w'hse).	6.07‡	...	...	5.83	...	5.88	6.62	...	5.82	6.02	7.47
Buffalo (del.)..	5.00‡	5.90	7.57	5.39	6.42	5.10	5.60	10.13	5.15	5.50	7.06
Buffalo (w'hse)	4.85‡	5.75	7.42	5.24	6.27	4.95	5.40	9.60	5.00	5.35	6.91
Pitts. (w'hse)..	4.85	5.75[4]*	6.80	5.00	6.00	4.90	5.40	9.20††	4.90	5.05	6.55
Detroit (w'hse).	5.32	6.22[4]*	7.35	5.42	6.42-6.73	5.48	5.90	8.44-8.59	5.48	5.67	7.02
Cleveland (del.)	5.00	5.90	6.70	5.15-5.18	6.15	5.15-5.16	5.60	7.84-8.00	5.15-5.16	5.35-5.36	6.80-6.81
Cleve. (w'hse) .	4.85	5.75	6.55	5.00-5.03	6.00	5.00-5.01	5.45	7.84-7.85	5.00-5.01	5.20-5.21	6.65-6.66
Cincin. (w'hse).	5.27‡	5.94**	6.83	5.39	6.10	5.44	5.95	...	5.44	5.64	7.05
Chicago (city) .	5.05	5.95[4]	7.05	5.05	6.35-6.85	5.10	5.60	7.90[8]	5.10	5.30	6.75
Chicago (w'hse)	4.85	5.75[4]	6.85	4.85	6.15-6.65	4.90	5.40	7.70[8]	4.90	5.10	6.55
Milwaukee (city)	5.18	6.08[4]	7.18	5.18	6.48-6.98	5.23	5.78	8.03[8]	5.23	5.43	6.88
Milwau. (c'try).	5.03	5.93[4]	7.03	5.03	6.33-6.83	5.08	5.63	7.88[8]	5.08	5.28	6.73
St. Louis (del.)	5.37	6.27[4]	7.44	5.34	6.64	5.39	6.19[6]	6.64	5.39	5.59	7.04
St. L. (w'hse) .	5.22	6.12[4]	7.29	5.19	6.49	5.24	6.04[6]	6.49	5.24	5.44	6.89
Birm'ham (city)	5.00	5.90	6.55	5.00	...	5.00	6.83	...	5.05	5.25	7.69
Birm'ham(c'try)	4.85	5.75	6.40	4.85	...	4.85	6.68	...	4.90	5.10	7.54
Omaha, Nebr...	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Los Ang. (city)	5.60	7.15	7.60	6.10	7.75	5.75	7.40	...	5.60	5.65	7.90
L. A. (w'hse)..	5.45	7.00	7.45	5.95	7.60	5.60	7.25	...	5.45	5.50	7.75
San Francisco..	6.15[10]	7.50[3]	7.80	6.75[10]	8.25[3]	5.90[10]	7.55	10.85[2]	5.90	6.35	8.10
Seattle-Tacoma.	6.70[7]‡	8.15[3]	8.80	6.70[7]	...	6.20[7]	8.15[1]	10.10	6.00[7]	6.35[7]	8.40[7]

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); § as rolled; ** 17 gage; †† as annealed. Base quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 1000 lb and over; galvanized sheets, 450 lb to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 1499 lb; [4]—400 to 1499 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—300 to 999 lb; [8]—1500 to 1999 lb; [9]—400 to 3999 lb; [10]—400 lb and over; [11]—500 to 1499 lb.

LEADING FERROALLOY PRODUCTS

Manganese Alloys

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, c.l., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

Chromium Alloys

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lots 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload. 1" x D; packed, max 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

Silicon Alloys

25-30% Ferrosilicon: Contract, carload, lump, bulk, 17.00c per lb of contained Si; packed 18.40c; ton lot 19.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15.00c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l., lump, bulk, regular 19.0c per lb of Si, c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 7.40c per lb of alloy, ton lots packed 8.80c, 200 to 1999 lb 9.15c, smaller lots 9.65c. Delivered. Spot up 0.5c.

Briquetted Alloys

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.30c. per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

Calcium Alloys

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot add 0.25c.

(Please turn to page 124)

Secondary Metal Prices Rise

Remelt aluminum ingot, aluminum and red metal scrap prices advance fractionally. Spot tin eases ⅛-cent to 95.75c and lead stablizes at 12.80-cent level

New York—Strength in secondary metals featured trading in nonferrous metal markets last week. Some remelt aluminum ingot producers advanced prices ¼-cent to ½-cent a pound, due to increased cost of scrap. Leading brass ingot makers held prices unchanged, although they also are paying more for their scrap.

As a result of the shrinkage in steel supplies, some metalworking plants are substituting aluminum for steel and this practice will broaden so long as the flow of steel is curtailed. Strength in the secondary copper market is supported indirectly by active demand for electrolytic copper which has imparted a firm price tone to that market.

The trend in these markets is running counter to that in lead, which has eased to 12.80c, St. Louis, and in tin which has eased to 95.75c, New York, for spot Straits. The latter market and zinc will remain dull until their largest outlet, the steel industry, resumes normal operations.

Aluminum—Strike in the basic industry and at nine plants of Aluminum Co. of America has resulted in a sharp increase in pressure for deliveries of aluminum products. Warehouse interests expect their stocks of aluminum sheets to be reduced sharply by Nov. 1, while mill backlogs for aluminum sheets and tubing are extended nearly two months; structural beams and channels about five to six weeks. Full effect of the steel strike on demand for aluminum products, however, is expected to reach its peak over the next two weeks as steel inventories become depleted.

Secondary Aluminum—Price spread being quoted on grades of remelt aluminum ingot has been widened to as much as ¾-cent a pound by the latest ¼ to ½-cent upward price revisions. Piston alloys are now quoted 16.25c to 17.00c and No. 12 foundry alloy, No. 2 grade, 15.50c to 16.25c. Although buying of deoxidizing grades is negligible due to the closedown of most steel mills, prices on these grades have also moved higher on the basis of increased scrap costs.

Copper—Users of copper continue to press for November coverage. Producers' books are filled for October, indicating that deliveries this month will exceed 104,000 tons compared with 103,115 tons in September and 113,154 tons in March, the high for the year to date. In addition to these deliveries to consumers, substantial tonnages are being taken by the government for stockpiling.

Demand for copper is coming from all classifications of consuming interests, including brass mills, wire mills and home appliance makers. Consumption is now running ahead of domestic mine and custom smelter supply, plus imports of about 30,000 tons monthly.

The 17.62½-cent price for electrolytic is described as strong. Some market observers believe that under normal conditions the price might have risen under pressure of the present buying movement. The steel strike is exerting a restraining influence, since copper consumers are unable to forecast with any degree of certainty what the ultimate effect will be on the general economy.

Refiners' scrap prices are higher at 13.75c to 14.00c for No. 1 copper, 12.75c to 13.00c for No. 2 copper, 11.75c to 12.00c for light copper and 12.00c for refinery brass. Ingot makers' bids also are higher at 14.00c to 14.25c for No. 1 copper, 13.00c for No. 2 copper, 12.00c for light copper, 11.25c to 11.50c for No. 1 composition red brass, and 8.75c to 9.00c for heavy yellow brass. The advance in scrap prices was necessary to stimulate the flow of material which has been sluggish this month.

Lead—A fair amount of business is being booked in the lead market at 12.80c, St. Louis. The latest reduction, amounting to ¾-cent and having been initiated by a custom melter on Oct. 14, was the sharpest in the present downward movement and brought the market within 1-cent of the year's low. Consumers are hesitant in making fresh commitments, fearing a further reduction in prices. However, custom smelters have announced that they believe the market will stabilize at the current level and that they will give the market opportunity to do so.

Zinc—A few galvanizing firms continued to place orders last week for prime western zinc at 9.25c, East St. Louis, but most of them show no interest in making new contracts while their plants are strike-bound. A tight supply situation is developing in special high grade zinc which commands a premium of 1-cent to 1¼-cents over prime western. This grade is used by brass mills and die casters and these consumers are showing increased buying interest. The tight supply situation stems from a strike at the New Jersey Zinc Co.'s smelter in New Jersey and sharply reduced operations of the Bunker Hill & Sullivan smelter in Idaho.

Due to the latest reduction in the price of lead, a leading manufacturer of zinc oxides has announced a further cut of ⅜-cent a pound in prices on leaded oxides, effective as of Oct. 17. The new carload price for the 35 per cent leaded grade is 12.00c per pound; for the 50 per cent leaded grade, 12.50c. Less carload lots are priced at the usual ¼-cent premium.

Tin—Moderate tonnages of Grade A tin are being sold on the basis of 95.75c for prompt delivery, a decline of ⅛-cent. Prices range downward to 95.00c for delivery in early November. Grade A tin for November arrival is offered at 94.87½c; for December arrival, at 94.00c by interests not selling against offerings originating with the British Ministry of Supply or the Dutch and Belgian producers. Some market interests believe that Reconstruction Finance Corp. will reduce its selling price to 95.00c, the level established by the British Ministry of Supply. This would establish a new basis for settlement on Bolivian concentrates received in October.

Production of tin at the Longhorn smelter in Texas City, Tex., amounted to 27,304 tons for the first nine months of this year. During the full year of 1948, 36,677 tons were produced compared with 33,677 tons in 1947 and 43,468 tons in 1946, the record high.

Aluminum Production Gains

Washington—Domestic production of aluminum increased to 55,777 net tons in July from 54,184 tons in June and compared with 52,937 tons in July, 1948, reports Bureau of Mines. Output continued to exceed shipments, which rose to 50,075 tons in July from 30,711 in June, so that inventories of pig aluminum at reduction plants reached 53,809 tons, or about the equivalent of one month's production. Stocks totaled 48,107 tons at the end of June and 11,746 tons at the end of April, the low for the year to date.

For the first time this year, exports of crude and semicrude aluminum in July nearly equaled imports. Receipts of crude from Canada, which constituted nearly all of the imports, declined about 36 per cent from June, and shipments of semicrude from United Kingdom were also greatly reduced. July exports of ingots, slabs and crude increased to 2334 tons while those of plates, sheets, bars, etc. amounted to 2303 tons.

Production of aluminum ingot at secondary smelters in May, the latest month for which figures are available, dropped to 7584 tons. Consumption of aluminum-base scrap for this record low-level output declined 8 per cent to 8697 tons.

Canadian Lead Price Declines

Montreal—Consolidated Mining & Smelting Co. of Canada reduced its lead price ¾-cent a pound on Oct. 17 to 14.25c. This action was taken following a like drop in the New York market on Oct. 14 to the basis of 13.00c, New York. The price of lead here has declined four times since Sept. 20 when it was established at 16.50c following devaluation.

Bauxite Production Increases

Washington—Domestic mine output of bauxite in the second quarter of 1949 is estimated by the Bureau of Mines at 332,553 long tons (dried equivalent.) Although final figures are not available for certain strike-bound operations in Arkansas, preliminary data indicates a gain of about 5 per cent over the 317,738 tons produced in the first three months. Over 96 per cent of the second-quarter total was mined in Arkansas, as production for other states taken together reached the lowest level in two years.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 17.62½c, Conn. Valley, Lake, 17.75c, Conn. Valley.
Brass Ingot: 85-5-5-5 (No. 115) 15.50-16.50c; 88-10-2 (No. 215) 24.50c; 80-10-10 (No. 305) 21.00c; No. 1 yellow (No. 405) 13.25-14.25c.
Zinc: Prime western 9.25c, brass special 9.50c, intermediate 9.75c, East St. Louis; high grade 10.25c, delivered.
Lead: Common 12.80c; chemical 12.90c; corroding 12.90c, St. Louis.
Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.
Secondary Aluminum: Piston alloys 16.25-17.00c; No. 12 foundry alloy (No. 2 grade) 15.50-16.25c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 17.50-17.75c; grade 2, 16.50-16.75c; grade 3, 15.50-15.75c; grade 4, 14.75-15.25c. Prices include freight at carload rate up to 75 cents per 100 lb.
5% titanium-aluminum alloy No. 1 (low Cu) 31.00c; No. 2 (2% Cu) 28.00c, f.o.b. Eddystone, Pa.
Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.
Tin: Straits and other Grade A tin, spot, 95.75c, New York; Straits, October, 95.00-95.50c; Straits, November, 95.00c. Chinese, 99% tin, October, 87.00-88.00c. RFC selling prices for prompt delivery, ex-dock New York or f.o.b. Texas City, Tex.: Grade A, 99.8% or higher (including Straits) 96.00c; Grade B, 99.8% or higher, not meeting specs. for Grade A, with 0.05% max. arsenic, 95.80c; Grade C, 99.65-99.79%, incl., 95.40c; Grade D, 99.5-99.649%, 95.40c; Grade E, 99-99.499%, 95.00c; Grade F, 98-98.999%, 94.50c; Grade G, 95-97.999%, 92.00c. Prices for Grade D through Grade G are for tin content.
Antimony: American 99-99.8% and over but not meeting specifications below, 32.00c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 32.50c; f.o.b. Laredo, Tex., for bulk shipments. Foreign, 99% (Chinese, English, Belgium), prompt, 26.25c, New York.
Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.
Mercury: Open market, spot, New York $73-$75 per 76-lb flask.
Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.
Cadmium: "Regular" straight or flat forms, $2 del.; special or patented shapes, $2.15.
Cobalt: 97-98%, $1.80 per lb for 550 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.
Gold: U. S. Treasury, $35 per ounce.
Silver: Open market, New York, 73.25c per ounce.
Platinum: $69-72 per ounce.
Palladium: $24 per troy ounce.
Iridium: $100-$110 per troy ounce.
Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; based on 16-cent copper.)

Sheet: Copper 31.30; yellow brass 28.19; commercial bronze, 95%, 31.28; 90%, 30.84; red brass, 85%, 29.89; 80%, 29.47; best quality, 29.01; nickel silver, 18%, 41.78; phosphor-bronze, grade A, 5%, 50.47.
Rods: Copper, hot-rolled 27.15; cold-drawn 28.40; yellow brass free cutting, 22.76; commercial bronze, 95% 30.97; 90% 30.53; red brass 85% 29.58; 80% 29.16.
Seamless Tubing: Copper 31.34, yellow brass 31.20; commercial bronze 90% 33.50; red brass 85% 32.80; 80% 32.38.
Wire: Yellow brass 28.48; commercial bronze, 95% 31.57; 90% 31.13; red brass, 85% 30.18; 80% 29.76; best quality brass 29.30.
Copper Wire: Bare soft, f.o.b., eastern mills, 100,000 lb lots 22.42½, l.c.l. 23.05, c.l. 22.55; weatherproof, f.o.b. eastern mills, 100,000 lb lots 24.693, l.c.l. 25.443, c.l. 24.943; magnet, delivered, c.l. 27.62½, 15,000 lb or more 27.87½, l.c.l. 28.37½.

ALUMINUM

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.063	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	R317-T4	—Hexagonal— 17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	37.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $18.00 per cwt; add 50c per cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $18.00 per cwt. Traps and bends: List price plus 48%.

ZINC

Sheets, 15.50c f.o.b. mill, 36,000 lb and over Ribbon zinc in coils, 15.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 14.00c; over 12-in., 15.00c.

NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 25.50c; 5 tons and over 26.00c; 1 to 5 tons, 26.50c; less than 1 ton, 27.00c.
Copper Anodes: Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 27.96c; oval 27.46c; cast 25.99c.
Copper Cyanide: 70-71% Cu, 100-lb drums, 45.00c f.o.b. Niagara Falls, N. Y.
Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,000 lb, 17.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.
Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 25.25c; over 250 lb, 24.25c, f.o.b. Cleveland.
Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; f.o.b. Cleveland.
Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbl, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.
Tin Anodes: Bar, 1000 lb and over, 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 2090 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c f.o.b. Sewaren, N. J.
Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c, f.o.b. Sewaren, N. J. On 100 or 350 drums only, 100 to 600 lb, 63.3c; 700 to 1900 lb, 60.9c; 2000 to 9900 lb, 59.1c; 10,000 lb and over, 58.00c, f.o.b. Carteret, N. J. Freight not exceeding St. Louis rate allowed.
Zinc Cyanide: 100-lb drums 40.50c, f.o.b. Cleveland; 39.25c, Detroit; 39.25c, Philadelphia.
Stannous Sulphate: Less than 2000 lb in 100 lb kegs, 100.00c, in 400 lb bbl, 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c, f.o.b. Carteret, N. J.
Stannous Chloride (Anhydrous): In 400 lb bbl, 88.00c; 100 lb kegs, 89.00c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	14.62½	14.62½	13.87½
Yellow brass	12.00	11.75	11.00
Commercial Bronze			
95%	13.62½	13.37½	12.87½
90%	13.50	13.25	12.75
Red brass			
85%	13.25	13.00	13.12½
80%	13.00	12.75	12.25
Best Quality (71-80%)	12.87½	12.62½	12.12½
Muntz Metal	11.12½	10.87½	10.37½
Nickel, silver, 10%	14.00	13.75	7.00
Phos. bronze, A	16.37½	16.12½	15.12½
Naval brass	11.62½	11.37½	10.87½
Manganese bronze	11.62½	11.37½	10.75

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 14.00-14.25; No. 2 copper 13.00; light copper 12.00; composition red brass 11.25-11.50; radiators 9.25-9.50; heavy yellow brass 8.75-9.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 13.75-14.00; No. 2 copper 12.75-13.00; light copper 11.75-12.00; refinery brass (60% copper) per dry copper content 12.00.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and Brass: Heavy copper and wire No. 1 12.00-12.50; No. 2 11.00-11.25; light copper 10.00-10.25; No. 1 composition red brass 9.00-9.25, No. 1 composition turnings 8.50-8.75, mixed brass turnings 5.50-5.75; new brass clippings 10.00-10.50; No. 1 brass rod turnings 7.75-8.00; light brass 5.50-5.75; heavy yellow brass 6.00-6.25; new brass rod ends 7.75-8.00; auto radiators, unsweated 7.25-7.50; coks and faucets, 7.25-7.50; brass pipe 8.00-8.25.
Lead: Heavy 9.50-9.75, battery plates 4.50-4.75; linotype and stereotype 10.00-10.25; electrotype 9.00-9.25; mixed babbitt 9.75-10.00.
Zinc: Old zinc 3.50-4.00, new die cast scrap 3.25-3.75, old die cast scrap 2.50.
Tin: No. 1 pewter 48.00-50.00, block tin pipe 70.00-72.00, No. 1 babbitt 36.00-38.00.
Aluminum: Clippings 2S 10.00-10.50, old sheets 7.00-7.50, crankcase 7.00-7.50, borings and turnings 3.00-3.50.

DAILY PRICE RECORD

1949	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Oct. 18-20	17.625	12.80	9.25	95.750	17.00	32.00	40.00	73.25
Oct. 17	17.625	12.80	9.25	95.875	17.00	32.00	40.00	73.25
Oct. 14-15	17.625	12.85	9.25	95.875	17.00	32.00	40.00	73.25
Oct. 10-13	17.625	13.55	9.25	95.875	17.00	32.00	40.00	73.25
Oct. 7-8	17.625	13.60	9.25	95.875	17.00	32.00	40.00	73.25
Oct. 4-6	17.625	14.05	9.25	96.00	17.00	38.50	40.00	73.25
Oct. 3	17.625	14.10	9.25	96.00	17.00	38.50	40.00	73.25
Oct. 1	17.625	14.55	10.00	96.00	17.00	38.50	40.00	73.25
Sept. Avg.	17.625	14.853	10.058	101.654	17.00	38.500	40.000	73.202

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

IRON AND STEEL SCRAP

(Dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted. Price changes are indicated by italic type)

STEELMAKING SCRAP COMPOSITE

Oct. 20	$26.17
Oct. 13	26.75
Sept. 1949	26.07
Oct. 1948	43.25
Oct. 1944	16.50

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 Heavy Melt.	*$29.00*
No. 2 Heavy Melt.	*27.00*
No. 1 Busheling	*29.00*
No. 1 Bundles	*29.00*
No. 2 Bundles	23.00-24.00
No. 3 Bundles	22.00-23.00
Heavy Turnings	22.50-23.50
Machine Shop Turnings	20.00†
Mixed Borings, Turnings	20.00†
Short Shovel Turnings	22.00
Cast Iron Borings	21.00*
Low Phos. Steel	31.00-32.00*

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00
No. 1 Machinery Cast	39.00-40.00
Charging Box Cast	31.00-32.00*
Heavy Breakable Cast	28.00-29.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	*31.00*
Axles	*35.00-36.00*
Rails, Random Length	*34.00-35.00*
Rails, 2 ft and under	*38.00-39.00*
Rails, 18 in. and under	*39.00-40.00*
Railroad Specialties	*32.00-33.00*
Angles, Splice Bars	*32.00-33.00*

* Nominal.
† Crushers' buying prices.

CLEVELAND

No. 1 Heavy Melt. Steel	$26.50†
No. 2 Heavy Melt. Steel	25.50†
No. 1 Busheling	26.50†
No. 1 Bundles	26.50†
No. 2 Bundles	23.50†
Machine Shop Turnings	17.00†
Mixed Borings, Turnings	19.00†
Short Shovel Turnings	19.00†
Cast Iron Borings	19.00†
Bar Crops and Plate	27.50†
Punchings & Plate Scrap	27.50†
Cut Structurals	29.50†

† Nominal.

Cast Iron Grades†

No. 1 Cupola	40.00-41.00
Charging Box Cast	34.00-35.00
Stove Plate	35.00-36.00
Heavy Breakable Cast	32.00-33.00
Unstripped Motor Blocks	30.50-31.50
Malleable	34.00-35.00
Brake Shoes	31.00-32.00
Clean Auto Cast	42.00-43.00
No. 1 Wheels	35.00-36.00
Burnt Cast	32.00-33.00

† Nominal.

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00-33.00
R.R. Malleable	34.00-35.00
Rail, 3 ft and under	38.00-39.00
Rails, Random Lengths	32.00-33.00
Cast Steel	27.00-28.00
Railroad Specialties	31.00-32.00
Uncut Tires	30.50-31.00
Angles, Splice Bars	34.00-35.00

VALLEY

No. 1 Heavy Melt. Steel	$31.00-31.50
No. 2 Heavy Melt. Steel	30.00-30.50
No. 1 Bundles	31.00-31.50
No. 2 Bundles	27.00-27.50
Machine Shop Turnings	19.00-20.00
Short Shovel Turnings	22.00-23.00
Cast Iron Borings	22.00-23.00
Low Phos.	32.00-33.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00-33.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	*$23.50-24.50**
No. 2 Heavy Melt. Steel	*22.00-22.50**
No. 1 Busheling	*22.00-22.50**
No. 1 Bundles	*23.50-24.50**
No. 2 Bundles	*20.50-21.00**
Machine Shop Turnings	17.00
Short Shovel Turnings	18.00
Mixed Borings, Turnings	*14.00-15.00*
Bar Crop and Plate	*26.00-27.00*
Punchings & Plate Scrap	*26.00-27.00*
Cut Structurals	26.00
Elec. Furnace Bundles	25.00-25.50
Heavy Turnings	*23.50-24.50*
No. 1 Chemical Borings	*26.00-27.00*

Cast Iron Grades

No. 1 Cupola Cast	32.50
No. 1 Machinery Cast	36.00-37.00*
Charging Box Cast	33.00-34.00
Heavy Breakable Cast	33.00-34.00
Unstripped Motor Blocks	29.00-30.00
Clean Auto Cast	36.00-37.00*
No. 1 Wheels	35.00-36.00*
Malleable	*37.00-38.00*

* Nominal.

CINCINNATI

No. 1 Heavy Melt. Steel	$26.00
No. 2 Heavy Melt. Steel	22.00
No. 1 Busheling	26.00
No. 1 Bundles	26.00
No. 2 Bundles	20.00
Machine Shop Turnings	12.00
Short Shovel Turnings	15.00
Mixed Borings, Turnings	15.00
Cast Iron Borings	15.00

Cast Iron Grades

No. 1 Cupola Cast	41.00
Charging Box Cast	31.00
Heavy Breakable Cast	34.00
Stove Plate	30.00
Unstripped Motor Blocks	20.00
Brake Shoes	22.00
Clean Auto Cast	38.50
Drop Broken Cast	45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	27.00
R.R. Malleable	33.00
Rails, Rerolling	37.00
Rails, Random Lengths	35.00
Rails, 18 in. and under	44.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	$17.00-18.00
No. 1 Bundles	20.00-21.00
No. 2 Bundles	17.00-18.00
No. 1 Busheling	20.00-21.00
Machine Shop Turnings	12.00-13.00
Mixed Borings, Turnings	12.00-13.00
Short Shovel Turnings	14.00-15.00
Cast Iron Borings	14.00-15.00
Punchings & Plate Scrap	20.00-21.00

Cast Iron Grades

No. 1 Cupola Cast	32.00-33.00
Heavy Breakable Cast	28.00-29.00
Clean Auto Cast	32.00-33.00

BUFFALO

No. 1 Heavy Melt. Steel	*$27.00-27.50*
No. 2 Heavy Melt. Steel	*24.50-25.00*
No. 1 Bushelings	*24.50-25.00*
No. 1 Bundles	*25.50-26.00*
No. 2 Bundles	*23.00-23.50*
Machine Shop Turnings	*18.00-18.50*
Mixed Borings, Turnings	*19.00-19.50*
Cast Iron Borings	*19.00-19.50*
Short Shovelings	*20.50-21.00*
Low Phos.	*28.50-29.00*

Cast Iron Grades

No. 1 Cupola	*37.00-37.50*
No. 1 Machinery	*38.00-38.50*
Mixed Yard	*35.50-36.00*
Malleable	*34.50-35.00*

Railroad Scrap

Rails, 3 ft. and under	*35.00-36.00*
Scrap rails	*30.00-31.00*
Specialties	*31.00-32.00*
No. 1 car wheels	*32.00-33.00*

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$18.50
No. 2 Heavy Melt. Steel	17.00
No. 1 Busheling	15.00-16.00
No. 1 Bundles	18.00-18.50
No. 2 Bundles	14.00-15.00
No. 3 Bundles	nominal
Machine Shop Turnings	10.00-11.00
Mixed Borings, Turnings	10.00-11.00
Short Shovel Turnings	11.00-12.00
Punchings & Plate Scrap	22.00-23.00
Cut Structurals	22.00-23.00
Elec. Furnace Bundles	*19.00-20.00*

Cast Iron Grades

No. 1 Cupola Cast	30.00-31.00
No. 1 Machinery	32.00
Charging Box Cast	25.00-26.00
Heavy Breakable	25.00-26.00
Unstripped Motor Blocks	26.00
Malleable	*32.00*

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$17.50-18.00
No. 2 Heavy Melt. Steel	*16.00-16.50*
No. 1 Bundles	17.00-18.00
No. 1 Busheling	14.00-15.00
Machine Shop Turnings	*9.00-10.00*
Mixed Borings, Turnings	*9.00-9.50*
Short Shovel Turnings	*11.00-12.00*
Bar Crops and Plate	19.00-20.00
Punchings & Plate Scrap	19.00-20.00
Chemical Borings	*18.00-19.00*

Cast Iron Grade

No. 1 Cupola Cast	30.00-31.00
Mixed Cast	27.00-28.00
Heavy Breakable Cast	*28.00-29.00*
Stove Plate	22.00-23.00
Unstripped Motor Blocks	20.00-21.00

CHICAGO

No. 1 Heavy Melt. Steel	$25.00-26.00
No. 2 Heavy Melt. Steel	23.00-24.00
No. 1 Bundles	25.00-26.00
No. 2 Bundles	22.00-23.00
No. 3 Bundles	16.00-17.00
Machine Shop Turnings	*19.00-20.00*
Mixed Borings, Turnings	*19.00-20.00*
Short Shovel Turnings	*20.00-21.00*
Cast Iron Borings	*19.00-20.00*
Bar Crops and Plate	29.00-31.00
Punchings	29.00-31.00
Elec. Furnace Bundles	25.00-26.00
Heavy Turnings	23.00-24.00
Cut Structurals	26.00-27.00

Cast Iron Grades

No. 1 Cupola Cast	41.00-42.00
Clean Auto Cast	41.00-42.00
No. 1 Wheels	33.00-34.00
Stove Plate	*33.00-34.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	31.00-32.00
Malleable	*37.00-38.00*
Rails, Rerolling	41.00-42.00
Rails, Random Lengths	*40.00-41.00*
Rails, 2 ft. and under	*41.00-42.00*
Rails, 18 in. and under	*42.00-43.00*
Railroad Specialties	33.00-34.00
Angles, Splice Bars	35.50-36.50

ST. LOUIS

No. 1 Heavy Melt. Steel	$28.00-29.00
No. 2 Heavy Melt. Steel	25.00-26.00
Machine Shop Turnings	*20.00-21.00*
Short Shovel Turnings	21.00-22.00

Cast Iron Grades

No. 1 Cupola Cast	36.00-38.00
Charging Box Cast	34.00-35.00
Heavy Breakable Cast	32.00-33.00
Brake Shoes	30.00-31.00
Clean Auto Cast	40.00-42.00
Burnt Cast	30.00-31.00

Railroad Scrap

R.R. Malleable	31.00-32.00
Rails, Rerolling	38.00-39.00
Rails, Random Lengths	32.00-33.00
Rails, 3 ft. and under	36.00-38.00
Uncut Tires	28.00-29.00
Angles, Splice Bars	33.00-35.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	24.50
No. 1 Busheling	24.00
No. 2 Bundles	22.00
Machine Shop Turnings	15.00
Mixed Borings, Turnings	15.00
Short Shovel Turnings	19.00
Cast Iron Borings	18.00
Bar Crops and Plate	30.00
Cut Structurals	23.00

Cast Iron Grades

No. 1 Cupola Cast	34.00-35.00
Stove Plate	28.00-30.00
No. 1 Wheels	23.00-24.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	28.00
R. R. Malleable	nominal
Rails, Rerolling	35.50-36.50
Rails 3 ft. and under	25.00-26.00
Angles and Splice Bars	31.00-33.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$17.00
No. 2 Heavy Melt. Steel	15.00
Nos. 1 & 2 Bundles	13.00

Cast Iron Grades

No. 1 Cupola Cast	23.00-25.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	17.00
Wheels	17.00
Rails, Random Lengths	17.00

SEATTLE

No. 1 Heavy Melt. Steel	$16.00
No. 2 Heavy Melt. Steel	16.00
No. 1 Busheling	13.50
Nos. 1 & 2 Bundles	14.00
No. 3 Bundles	nom.
Machine Shop Turnings	11.00
Mixed Borings, Turnings	11.00
Punchings & Plate Scrap	22.00
Cut Structurals	22.00
Elec. Furnace Bundles	23.00

Cast Iron Grades

No. 1 Cupola Cast	25.00-27.50
Heavy Breakable Cast	17.00
Stove Plate	17.00
Unstripped Motor Blocks	17.00
Malleable	20.00
Brake Shoes	17.00-18.00
Clean Auto Cast	23.00
No. 1 Wheels	22.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	17.00
Railroad Malleable	22.00
Rails, Random Lengths	17.00
Angles and Splice Bars	17.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	nom.
Machine Shop Turnings	12.00
Mixed Borings, Turnings	12.00
Punchings & Plate Scrap	24.00
Electric Furnace Bundles	26.00

Cast Iron Grades

No. 1 Cupola Cast	$30.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Rails, Rerolling	25.00

HAMILTON, ONT.

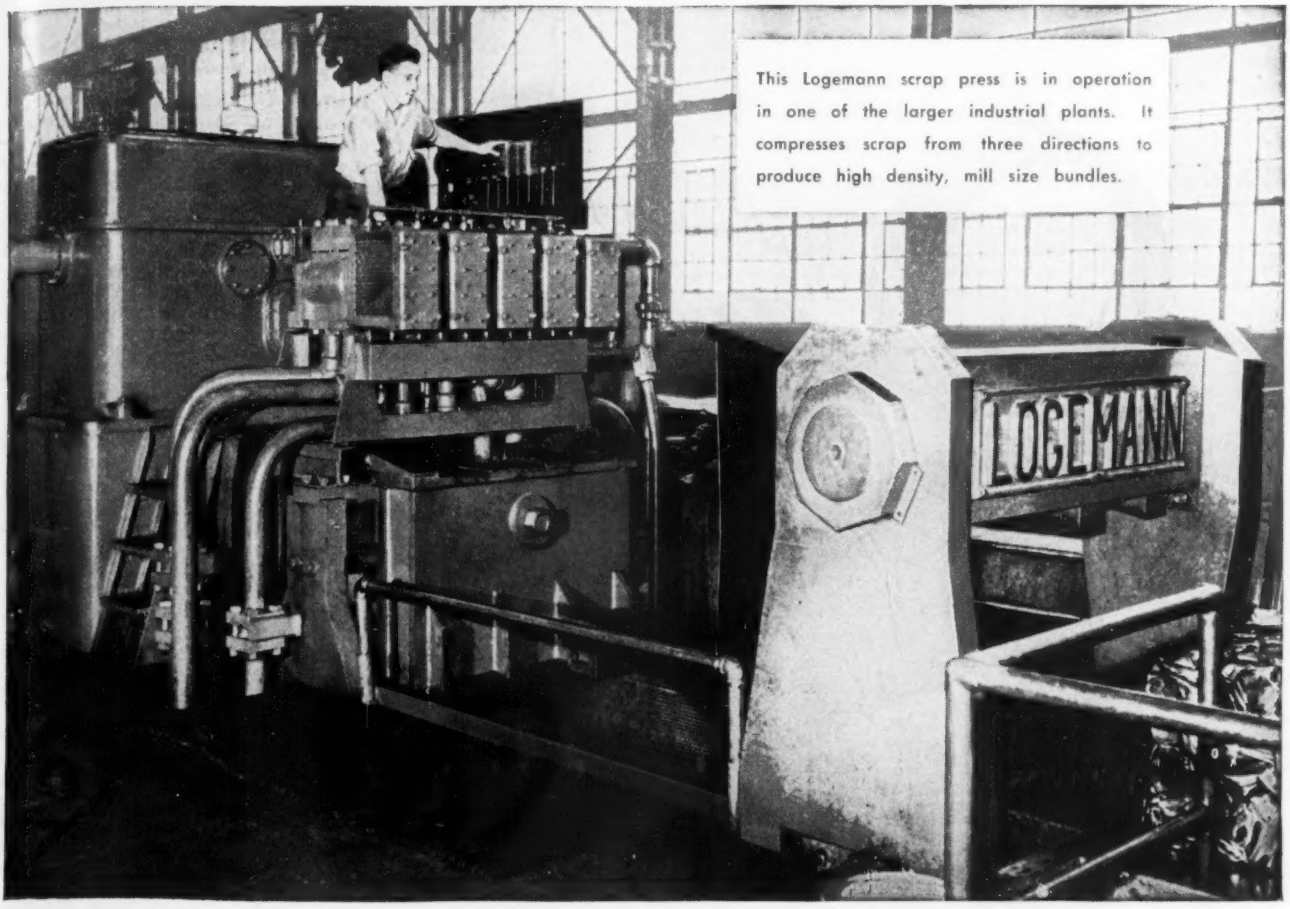
(Delivered prices)

Heavy Melt.	$20.00
No. 1 Bundles	20.00
Mechanical Bundles	18.00
Mixed Steel Scrap	16.00
Mixed Borings, Turnings	14.00
Rails, Remelting	20.00
Rails, Rerolling	23.00
Busheling	14.00
Bushelings new factory, prep'd	18.00
Bushelings new factory, unprep'd	13.00
Short Steel Turnings	14.00

Cast Iron Grades*

Cast	33.00-35.00

* Removed from price control Aug. 9, 1947; quoted on basis of f.o.b. shipping point.



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Sheets Strip . . .

Sheet and Strip Prices, Page 99 & 100 & 101

Boston—Delivery of sheets ordered for shipment through November, is problematical. Assuming rolling is resumed in the near future, revision of schedules for tonnage on books at time of suspensions, plus scheduling of volume taken since, may extend delivery promises on new orders into January on hot-rolled sheets and into February and March on cold-rolled. Three weeks will be required after the strike ends to bring some mills up to 85 per cent of capacity. Cutbacks on some tonnage are likely until producers eliminate arrearages. Meanwhile, users of flat-rolled products see inventories steadily decline, although curtailments in metalworking operations are not yet serious. Cold-rolled strip supply is freer than that of sheets. Production of cold strip holds up well with one leading producer down. Hot-rolled strip demand is heavier. Converters have cut deeper into hot-strip reserves than expected, some already needing additional steel. Producers are more selective in taking new volume on both high and low carbon. As expected, builders of household fuel tanks using heavy gage hot-rolled sheets are short of stock.

Bethlehem Steel Co. has received a contract for 1200 tons, deep-drawing cold-rolled sheets for Massachusetts automobile plates at 4.85c, Sparrows Point, Md., or 5.47c, delivered Charlestown Prison, Boston

New York—The majority of sheet sellers are accepting orders for first quarter. Those mills down because of the strike assert they were booked up for the entire quarter, on some grades even before the walkout. They have tonnage that can't be moved until after the turn of the year, regardless of how soon a labor settlement is made, but are accepting additional orders from regular customers. At least one mill, which has not been affected by a labor walkout, is not accepting any tonnage for first quarter. This producer has tonnage only in certain specialties, including stainless sheets, for shipment in the current quarter.

District sheet metal shops have maintained good operations since the beginning of the steel strike, but several will curtail this week as stocks are becoming unbalanced.

Philadelphia—Sheet steel producers will be forced to go on allocation once mill operations are resumed. Consumers also face the prospect of a possible price increase, depending on the final settlement of the labor dispute. Some buyers are holding up until they can gage outlook more accurately. Sheets are still the most active of all products except possibly pipe. Most producers are accepting orders from regular trade for shipment after turn of the year. Buying is not as heavy as two weeks ago, as consumers are becoming less sure of their future positions. Most are ordering ahead on theory they can always cancel in event they do not need the tonnage.

Pittsburgh — Operating schedules among metalworking concerns here are not expected to be adversely affected by unbalanced stocks of sheets

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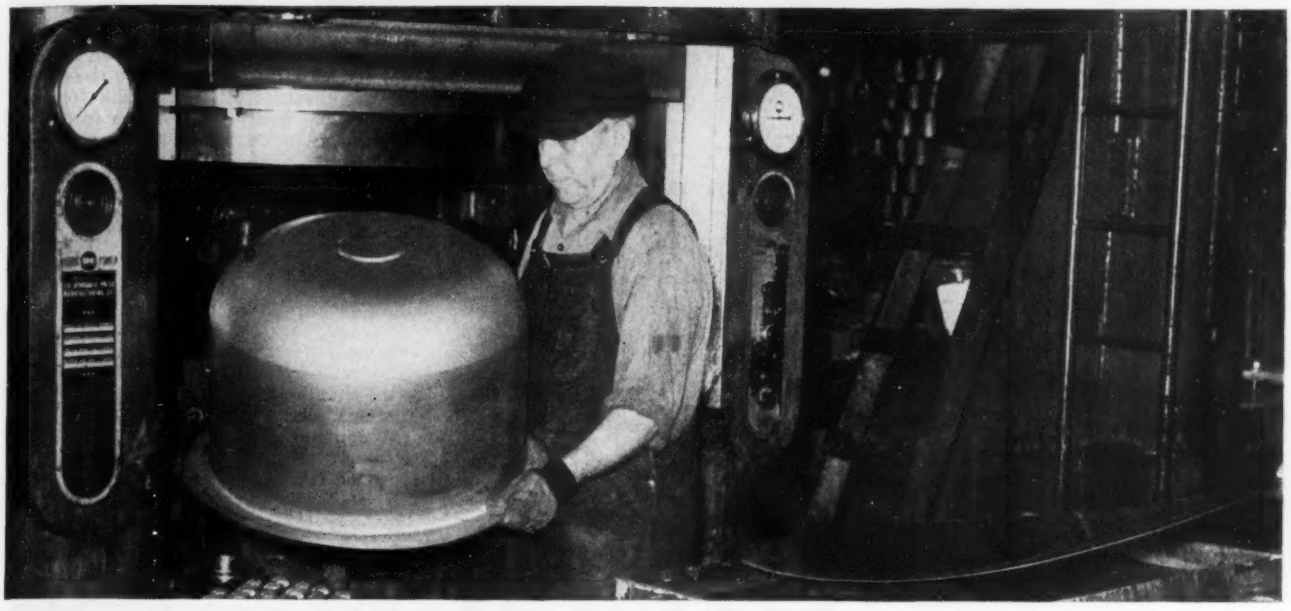

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real toughness
long wearing
free cutting

. . . an exceptionally adaptable alloy steel

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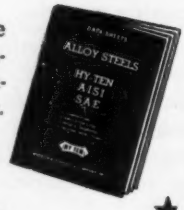

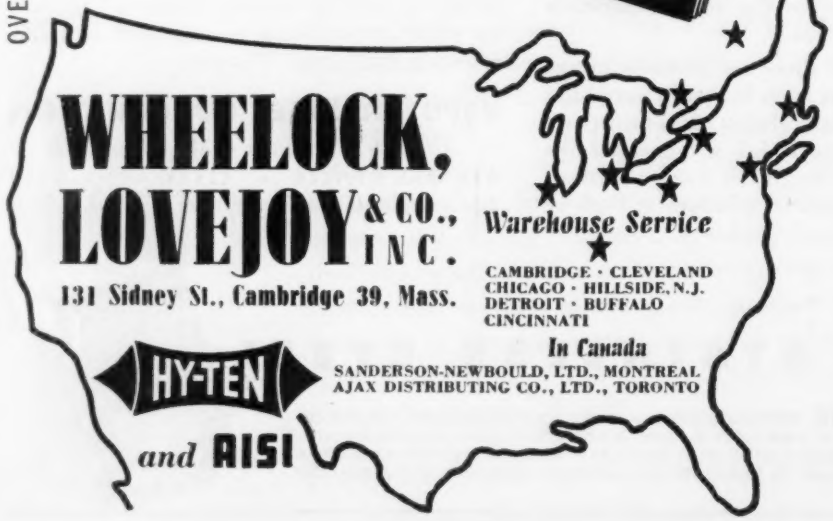

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HY-TEN and AISI

and strip until early next month. Unbalanced stocks of component parts are major threat to continued operations. Westinghouse Electric Corp. probably will begin tapering production schedules about Nov. 1, at its East Pittsburgh and Mansfield, O., plants. The government's grain bin program will not be so adversely affected as earlier feared. Weirton and Armco are still producing galvanized sheets in large volume, while galvanizing pots at two nonintegrated steel plants previously shut down are in operation. In some instances aluminum has been utilized as a substitute.

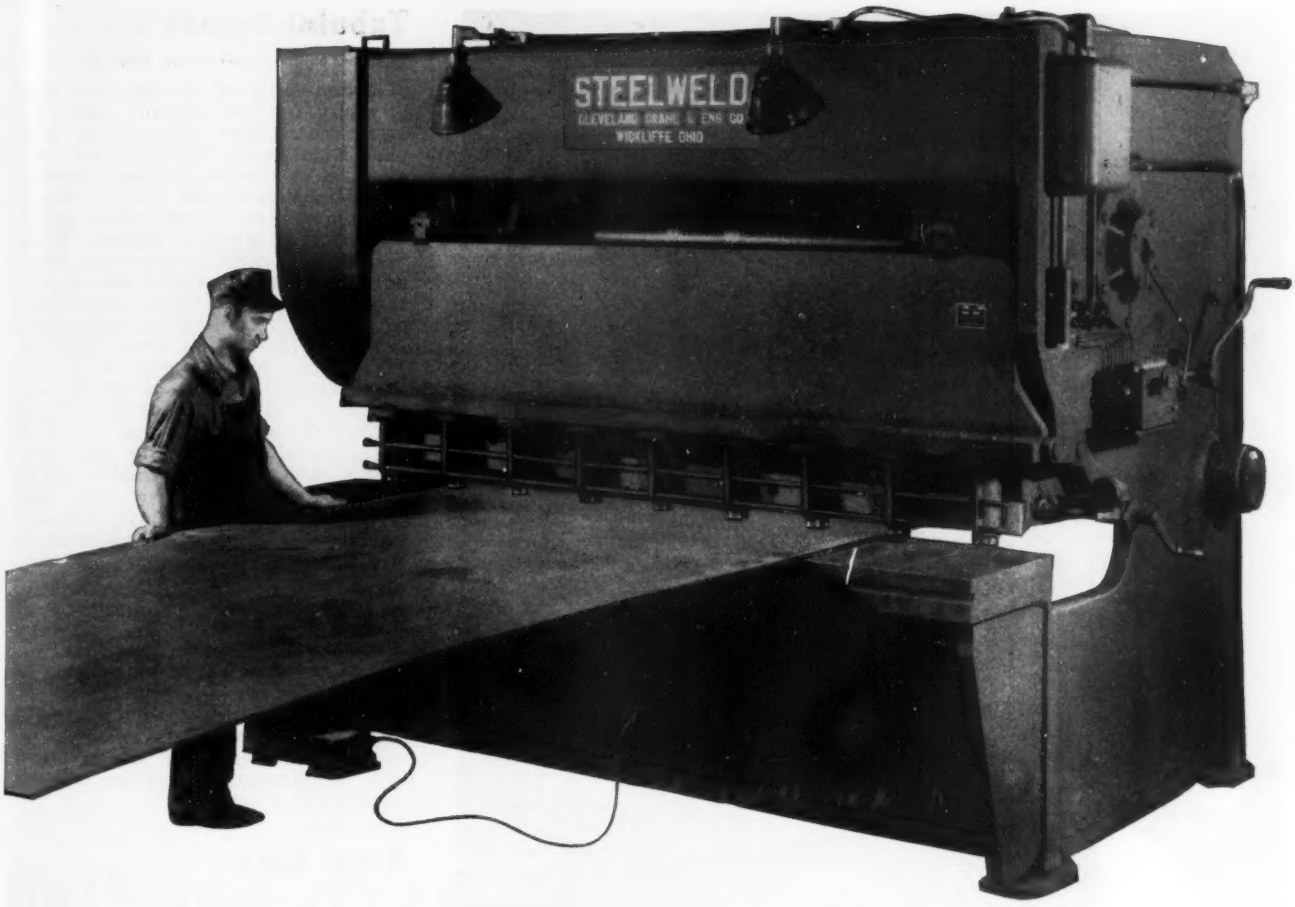
Chicago—Steel consumers are being warned to review their production schedules since it will be an extended time after the strike is settled before distribution gets back to normal. The quota system, as formerly applied may not be used because demand at end of the strike will be huge but probably relatively short lived. First to catch up probably will be structurals and rails, then plates, bars, and finally pipe and sheets. Cold-rolled and galvanized sheets, tin plate and pipe will be longest in demand, shortest in supply. Probably in only the latter items will formal allocation be necessary after the initial rush for steel is handled. On the basis of orders in hand at some local mills, February appears to contain the earliest open rolling capacity for sheets if the strike were settled today.

Milwaukee—Wholesale layoffs likely will start here at metalworking plants if the steel strike continues ten more days. The situation isn't critical yet. Several local concerns, including electrical apparatus makers, are getting order cancellations. A number of others, making parts for steel mills and closely allied industries, however, have received orders since Oct. 1 and are under instructions to ship as soon as the strike is settled.

St. Louis—Sheet demand continues to increase sharply here as manufacturers of metal products marketable in the east expand operations to maximum to take advantage of shortages created in areas affected by the steel and coal strikes. Local sheetmakers have filled books through the first quarter and have not opened those for the second quarter. There is a flood of "phantom" orders which fabricators are attempting to place as protection against a long strike.

Los Angeles—The real pinch in flat-rolled products has not yet developed, but it is not far off. Sheet supplies generally are still liberal, but cold-rolled and galvanized material is extremely tight. Consumers of cold-finished strip in many instances had worked off much of their inventory prior to the strike. Despite the fact two cold strip mills in this district are producing at capacity, supplies of this product are far from adequate.

San Francisco—Supplies of light gage galvanized sheets have practically disappeared in this district. Heavier galvanized sheets are available, but stocks are dwindling rapidly. Supplies of hot and cold-rolled sheets are more plentiful, but heavy demand, especially for hot-rolled items, indicates sharp reduction of inventories by end of this month.



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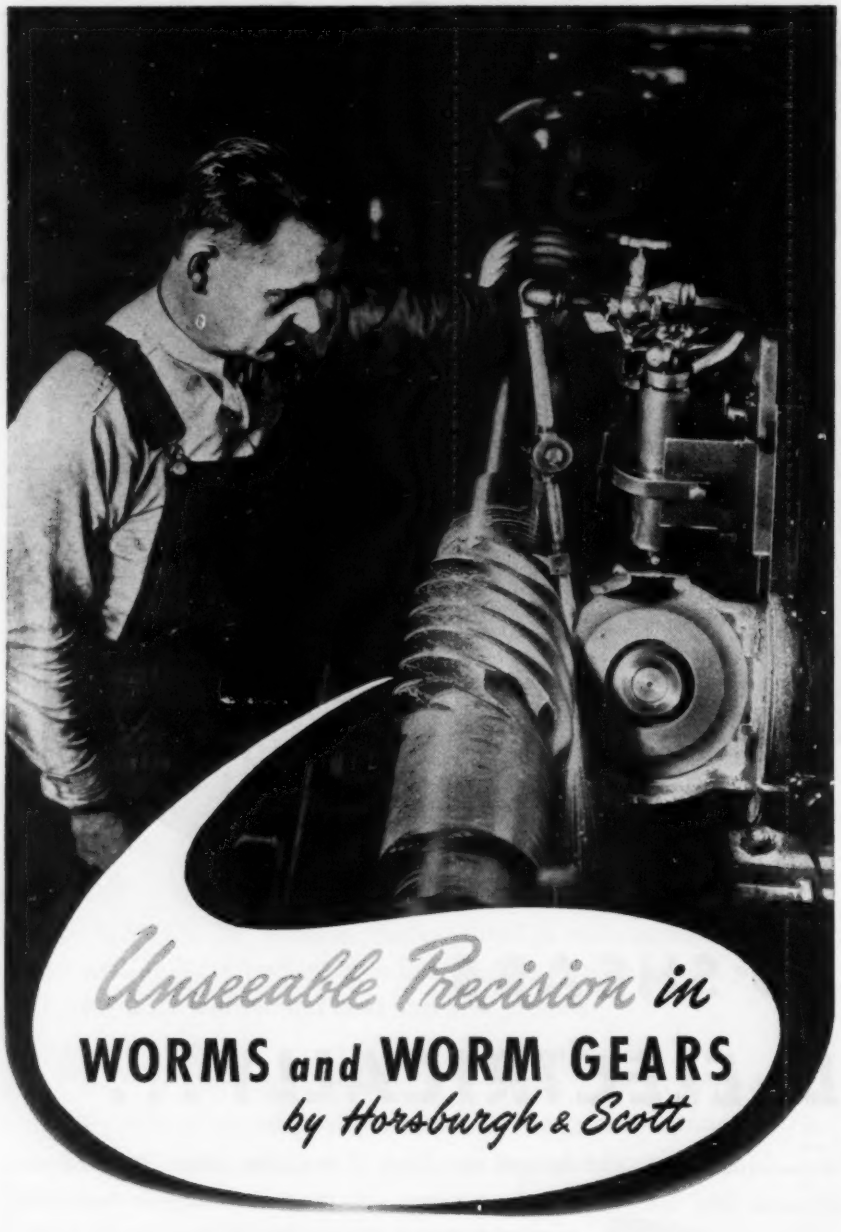

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Tubular Goods . . .

Tubular Goods Prices, Page 102

Boston—Buying of cast iron pipe is heavy for this season, orders for better than 3000 tons having been placed last week. Distributor's merchant steel pipe stocks are becoming more unbalanced and their inventories, none too large when strike started, are steadily falling. Early pressure on mills is expected. Since withdrawal of consigned stocks, distributors have been more conservative in carrying inventory and they were following this policy when the flow of new supplies was shut off.

Pittsburgh — Jobbers are experiencing a sharp increase in demand for pipe and tubing items. In most instances these interests are allocating shipments from rapidly dwindling inventories. Some line pipe construction programs have been curtailed or temporarily abandoned.

San Francisco—Shutdown of large diameter pipe producing facilities soon will affect some major pipeline projects. Smaller pipe generally is in better supply in this area.

Seattle—Cast iron pipe agencies report small sales out of stock, but the market generally is quiet. Large consumers, who bought heavily during the shortage, are well stocked and will remain out of the market for several months.

Steel Bars . . .

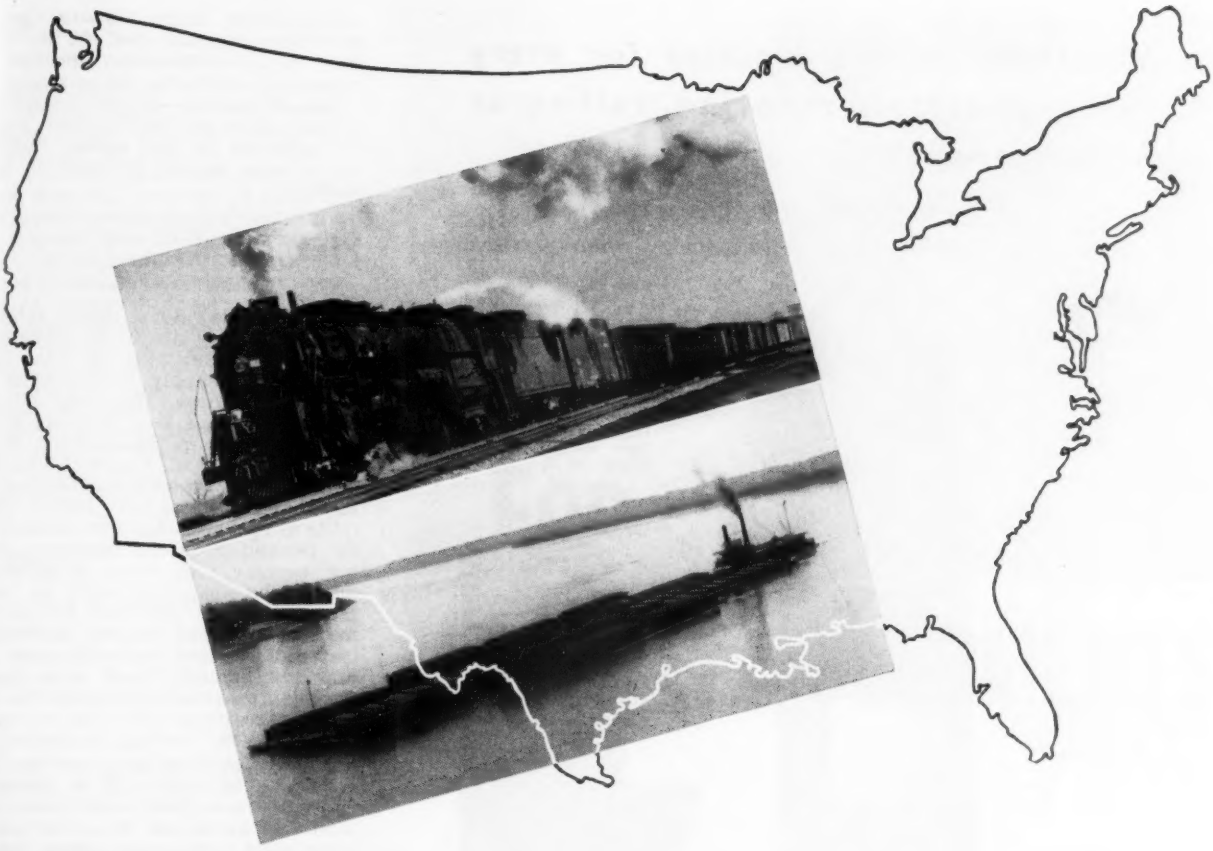
Bar Prices, Page 99

Philadelphia—Hot carbon bar producers generally declare that, if there is an early settlement of steel strike, they will be able to make shipments against new orders before the end of year. There is active demand for bars for near-by shipment as indicated by pressure on jobbers. At the same time, there is less interest in future positions, due not only to uncertainties as to mill deliveries but also as to requirements some few weeks off. Cold-drawn bars are in good demand, but trading is handicapped by unbalanced stocks.

New York—Hot carbon bar consumers can place orders for shipment this year, subject to early adjustment in the steel labor dispute. Various mills at the beginning of the strike had been promising shipment within three to four weeks. In certain instances tonnages now being booked can't be handled until after Jan. 1.

Boston — While mild improvement in demand for some products fabricated from carbon bars is maintained, including files, bolt and nut specialties and small forgings, consumption has not seriously taxed inventories. Bar mills are in a position to schedule ahead of most other products once rolling is resumed and some firm deliveries for December appear possible should production start by early November. Bar orders are being accepted on basis of earliest delivery possible, but in some instances mills are not taking volume beyond January.

Los Angeles—Supplies held by bar fabricators average two to three weeks; warehouse stocks are fairly good. One manufacturer of industrial items, whose bar inventory is



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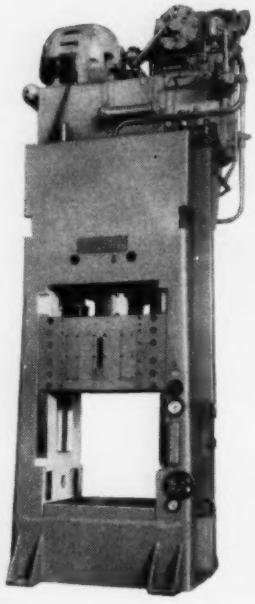
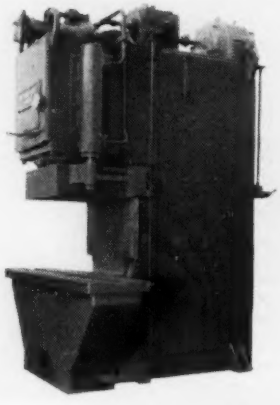
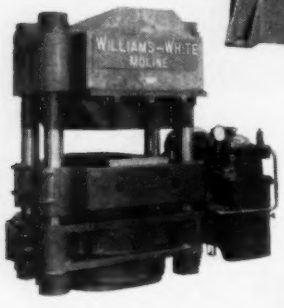


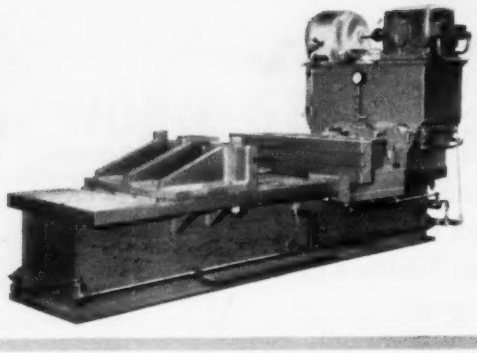
At right: 500-Ton Hydraulic Housing Press: Bed and ram area, 48 x 48 in.; Daylight opening, 54 in.; Stroke, 36 in.; Drawing speed, adjustable; Hydro - pneumatic die cushion.

Below: 500-Ton Hydraulic Gap Frame Press: Platen surface, 24 x 96 in.; Throat, 18 in.; Daylight opening, 30 in.; Stroke, 24 in.



Below: 600-Ton Column Moving Up Hydraulic Press: Platen surface, 42 x 60 in.; Daylight opening, 24 in.; Stroke, 12 in.





At right: 200-Ton Hydraulic Bulldozer, with adjustable end lug. Die space, 36, 48 and 60 in.; Stroke, 24 in. Foot button or treadle control.

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exceptionally large, reports that a secondary reaction has set in, with some of its customers cancelling or extending orders for its products.

San Francisco—Large inventories of bars, plus production from plants not affected by the strike, indicate no serious supply problem in this product.

Plates . . .

Plate Prices, Page 99

Philadelphia—Some tank fabricators claim they are in no immediate danger of curtailment, at least insofar as steel supply is concerned. In certain instances, this may be due to the fact that two plate mills are still operating in this district. South Chester Tube Co., Chester, Pa., has been forced to suspend because of lack of skelp. The two district plate mills in operation are now booked into December. That backlogs have not become still more extended as might be expected with so much plate capacity affected by strikes may be ascribed in part to continued dull demand from railroads, oil and gas industry and ship yards. Strong pressure still prevails for light gage plates for fuel oil tanks and domestic heating equipment.

New York—Backlogs of the two eastern plate mills still in operation continue to expand, with little now available under six to seven weeks. Meanwhile, other producers whose plants are strike-bound report a fair amount of demand from various consumers who are running short of plates and endeavoring to get preferred positions on mill schedules. Some plate fabricators are curtailing operations due to unbalanced supplies.

Tank fabricators are experiencing a continued drop in industrial requirements. Public demands have increased appreciably as a result of exceptional droughts this summer in many sections of the country. Backlogs at most tank shops are down noticeably. One interest, for instance, reports backlogs of only three to four months, as against 10 to 11 months a year ago.

Boston—Plate demand is featured by heavier requirements for large diameter pipe in connection with Metropolitan District commission water lines, taking close to 3000 tons. Plates for fabrication of this pipe may not be available to meet delivery specified; bulk of tonnage will be fabricated in Holyoke, Mass. While some tonnage is trickling in from two Pennsylvania mills, inventories held by tank and other fabricators are declining steadily.

Los Angeles—Fabricators and jobbers report that plate supplies are comparatively good, with demand generally showing little urgency. Moreover, with Kaiser's plate mill at Fontana in operation, this category probably is in the most favorable supply position of all flat-rolled products.

Seattle—Inquiry for plates is inactive and smaller plants are curtailing operations. Orders consist mainly of tonnages under 100 tons. The largest pending project is the Lucky Peak tunnel for which 1400 tons of lining plates will be required.

Wire . . .

Wire Prices, Page 101

Boston—Although starting to run short on some sizes, wire consumers, including screw producers, are not too seriously affected by the strike. There are exceptions, but fresh supply of wire has not halted entirely since several producers are operating. Most drawers have fairly wide stocks of rods. Screw manufacturers are also drawing rods to wanted sizes in some instances. Demand for screws is more active with some tendency toward forward buying. Aircraft volume is increasing; United Aircraft Corp., East Hartford, Conn., recently booked a $7,114,933 Navy order for engines and propeller assemblies. Aviation Supply Office, Philadelphia, is closing on a large wire rope inquiry for various deliveries.

Tin Plate . . .

Tin Plate Prices, Page 100

Pittsburgh—Most can companies have fairly large inventories of tin mill products, although some curtailment in production schedules may be necessary early next month because of unbalanced stocks. Sellers' inventories were nearly depleted prior to the start of the strike Oct. 1. This situation, combined with necessity to rebuild customers' stocks, should result in near capacity production schedules for an extended period following termination of the strike. Sellers have received sizable orders since Oct. 1 for as early scheduling as possible at strike's end. Since mills had relatively little stock on hand Oct. 1, these orders can not be filled until previous order backlog ranging from 6 to 8 weeks has been shipped.

Reinforcing Bars . . .

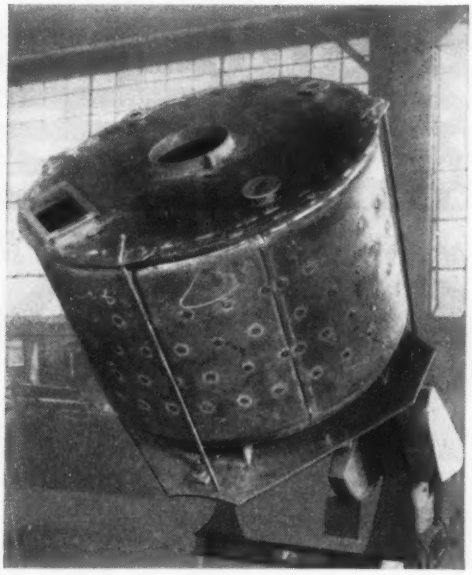
Reinforcing Bar Prices, Page 99

Chicago—Fabricators are engaging in a serious game of cross-hauling steel to keep their jobs moving on schedule. Sizes are running out now, but fortunately the shortages are staggered well enough among various plants so that the repercussions of the strike are relatively minor as yet.

Los Angeles—Construction is virtually at a standstill, due chiefly to a strike of engineers operating sand and gravel equipment. Nearly every pit in the Los Angeles area is shut down, with consequent effect on all concrete construction projects. This comes at a time when building was undergoing a sharp increase. During September, permits for commercial construction in ten Southern California counties rose 29 per cent in dollar volume over the preceding month; new industrial construction, 5 per cent; private institutional building, 33 per cent.

San Francisco—No immediate difficulty is foreseen in reinforcing material. Inventories are estimated sufficient to meet most needs until Dec. 1. Three West Coast plants are producing: Kaiser's Fontana, Judson Steel Corp's Oakland, and Pacific States Steel Corp.'s Niles mill.

Seattle — Volume of inquiry for



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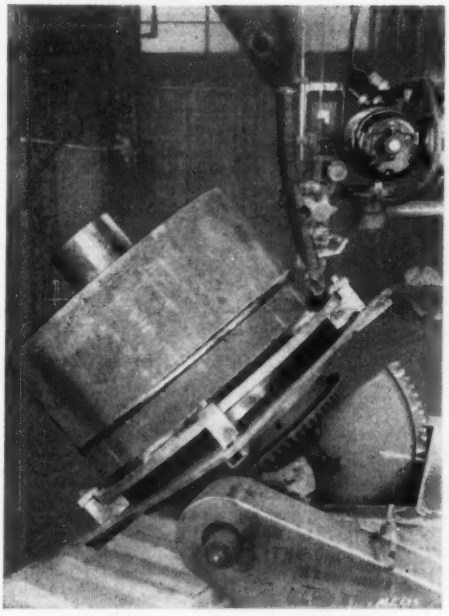

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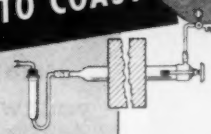

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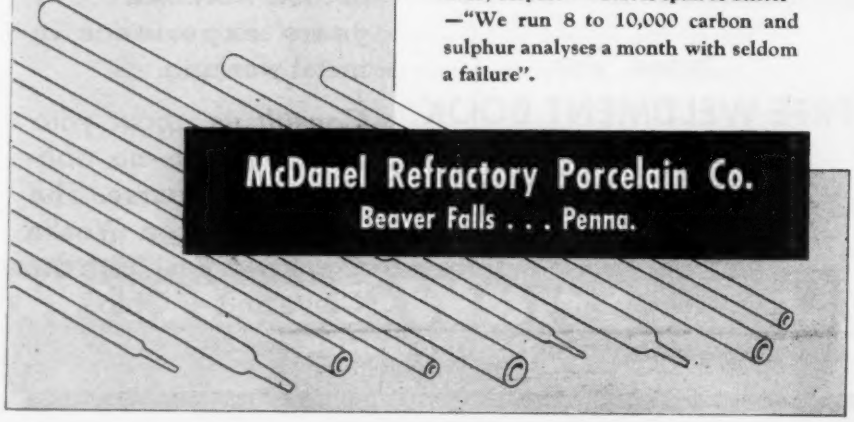

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reinforcing materials is fair, especially in small tonnages. Some business has been diverted from strike-bound plants to Northwest Steel Rolling Mills Inc., which is operating at capacity.

Tool Steel . . .

Tool Steel Prices, Page 101

Pittsburgh—Braeburn Alloy Steel Corp., Braeburn, Pa., was closed by a strike Oct. 15; other leading tool steel producers in this area continue in operation. Allegheny Ludlum Steel Corp.'s contract has been extended to Nov. 1. Those tool steel interests still operating report no marked increase in orders. Customers' stocks apparently are adequate in most instances in spite of strike possibility for tool steel producers.

Structural Shapes . . .

Structural Shape Prices, Page 99

New York — District fabricating shops are maintaining operations, but are nearing the squeeze-point, as stocks are becoming unbalanced. Certain fabricators are confronted with expiration of labor contracts which may spell trouble in the near future. Inquiry has eased somewhat due both to the unsettled labor situation and seasonal influences.

Boston—Bridge shops account for bulk of structural tonnage placed. District shops are taking smaller tonnage contracts with backlogs gradually lower. Most fabricators will not be pinched for plain material for some weeks. Most of the larger fabricating shops are operating with an escalator clause, while small-lot work usually is based on firm bids. Elliot street bridge project, Boston, involving 400 tons, will be of welded construction.

Philadelphia—Structural demand is light. Later in the year, substantial inquiries are expected for western extension of the Pennsylvania Turnpike. Only one small order has been placed against this program to date. Shape mills still are accepting orders for shipment this year, assuming a reasonably early settlement of steel strike.

Pittsburgh—Activity among structural fabricators is fairly well sustained. Outlook is not promising, however, because of difficulty in obtaining odd size specifications for work booked since mid-September. Wide flange beams particularly are in short supply. New inquiries are largely limited to public work. Some new contracts have been made by fabricators since Oct. 1, but these have been restricted mainly to jobs requiring standard size structural items. Most fabricators have placed orders with mills for early scheduling following end of the strike.

San Francisco — Although some structural fabricators may find difficulty in filling needs for specialized products, overall inventory position in structurals is good.

Seattle—Fabricators are seeking new contracts as backlogs are small. Inventories are sufficient to insure operations for about 60 days. Not many projects involving large tonnages are up for bids.

Pig Iron . . .

Pig Iron Prices, Page 98

New York—Pressure on the few eastern seaboard furnaces still in operation continues heavy, inquiries coming from as far away as the middle west. There is also substantial demand for coke from remote sections. Some of these requirements for coke and pig iron are being met. Meanwhile, some interest is developing in Dutch iron which is offered at around $47, f.o.b. eastern seaboard. The iron is foundry grade, sand cast, high in phosphorus and low in manganese. Deliveries are around three to four weeks. Some offerings at around the same level are being made by Austria and Luxemburg. No transactions have been reported except in some Royal Dutch iron, which was sold at concessions as off-grade material, to supplement supply of cast scrap.

Boston—Stocks of basic iron held by steelworks which are still operating are fair, sufficient for about 30 days in one instance. Prolonged suspension could be serious with basic consumers, due to shutdown of furnaces supplying this grade. Mystic furnace production is going largely into consumers' hands and less tonnage to stockpile. Foundry melt this month maintains the improvement which started in late summer.

Pittsburgh — Jobbing foundries report a sharp drop in new orders, consequently some have curtailed operations to two or three days per week. Coke supply, rather than pig iron, is chief production bottleneck. Foundries serving the radiation industry have been very active and are feeling the coke shortage. Merchant foundry iron supply appears adequate, with stocks among foundries estimated to exceed more than three weeks' requirements. Pig iron stocks built up by the leading merchant blast furnace interest through spring and summer months have been depleted.

Philadelphia—While the few eastern blast furnaces still in operation are confronted with good near-by demand from foundries, they nevertheless are able to meet some needs from as far inland as Ohio. The Chester, Pa., blast furnace of Allied Iron Works Inc., which has been down for several months, is being offered for sale at a price substantially below amount expended by the company last year in improvements.

Buffalo—Tonawanda Iron Division, American Radiator & Standard Sanitary Corp., has blown-in its idle blast furnace after a five-month shutdown. A portion of output will move into outside consuming channels. The company's contract with USW does not expire at this time. No serious curtailment in operations is noted among foundries because of the steel tieup. Coke shipments continue to decline. Malleable melters are hard hit by the falling off in railroad demands.

Cincinnati — Foundry melt continues unchanged at the higher level attained in September. Pig iron supplies are adequate. Melters are ordering normally, without attempting to build inventories because operations may be curtailed by a shortage of coke should the steel strike be prolonged.

Milwaukee—Users of gray iron castings continue to specify, the direct effects of the steel strike so far being limited. Consensus is that a sudden drop in demand is just around the corner and probably will come before pig iron and coke supplies give out. Some nonferrous foundry operators think their product will be needed to fill in at some applications when gray iron shops are forced to close for lack of raw materials.

St. Louis — Strike-spurred demand for castings has pepped up calls for pig iron by some foundries, although other foundries report order cancellations for the same cause. Ample iron is available to local consumers, but only a few outside orders are being accepted. A coke shortage is the worst threat to iron production. Koppers Co. at Granite City, Ill., has slowed its coke ovens to conserve coal.

Birmingham—Demand for pig iron is extremely heavy. The district's two merchant melters are producing at capacity, but cannot come close to meeting the abnormal demand. While most of the output is consumed regionally, demand from other quarters is insistent.

Seattle — Foundry operations are declining and do not exceed 50 per cent of capacity. No pig iron is immediately available, but plants have inventories for present needs. Colorado Fuel & Iron Co., is offering in this area on a competitive basis with Provo, Utah, by absorbing freight.

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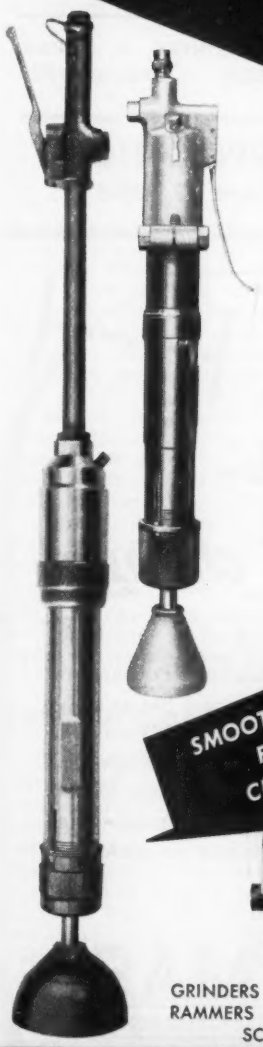

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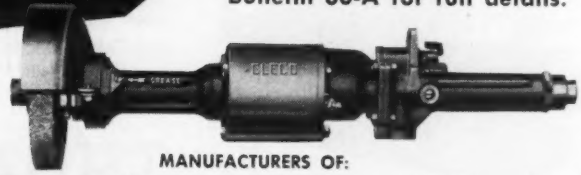

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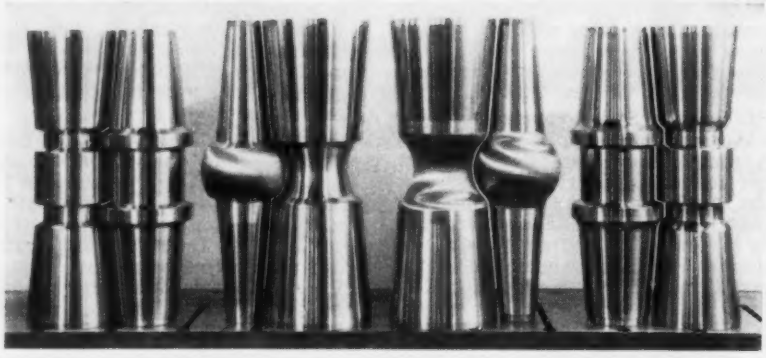

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Scrap . . .

Scrap Prices, Page 106

Pittsburgh — Some weakness in open-hearth scrap quotations developed last week with at least one mill purchasing a sizable tonnage composed of small lots, at $29 for No. 1 heavy melting, off $1. Purchases of No. 2 heavy melting steel at $27, No. 2 bundles at $24, and No. 1 railroad heavy melting at $31 were also noted. No dealer or broker offerings for industrial No. 1 heavy melting were reported below $29. Those mills in position to accept scrap shipments reason it is to their advantage to enter the market during current period of limited competition for available scrap and weakening price levels. Such action should also help stabilize quotations following termination of strike when there otherwise conceivably could develop heavy mill purchases with resultant sharp upturn in quotations. No transactions in turnings were reported, while activity in cast scrap was restricted. Some railroad lists have been withdrawn because of inability to find a "home," reduction in line crews and desire to stabilize the market during absence of mill buying on large scale.

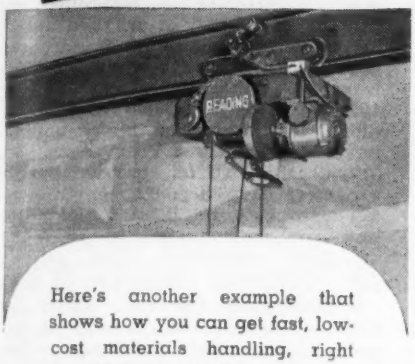
Philadelphia—Steel scrap quotations are easier on the basis of some sellers' offering prices. There has been no recent mill buying to establish a definite market, although some may develop shortly. No. 1 heavy melting is holding nominally at $23.50-$24.50, delivered. Other leading open-hearth grades also are nominally lower. Mixed borings, bar crop and plate and punchings and plate scrap are lower, while No. 1 chemical borings are higher. Undertone in cast grades is slightly stronger, although there is no price change except in malleable which is higher at $37-$38, delivered.

Boston—One operating steel plant is paying $18.50, including brokers' fee, for No. 1 heavy melting steel while $16-$16.50 holds for No. 2. Buying is spotty in car lots, but steelmaking grades are generally steady with demand for bundles slow. Foundry demand is also slow, but cast grades display no price weakness.

New York—Steel scrap trading is extremely dull. Prices on all major open-hearth grades are nominally unchanged. Brokers have reduced electric furnace bundles to $19-$20 f.o.b. shipping point. Some trading continues in the cast grades, but with the exception of malleable, brokers buying prices are steady. Malleable is higher at $32.

Chicago—Limit of scrap yards' capacity is about reached here and expectations are that production curtailments by many metalworking plants in the near future will about coincide with the time dealers must stop buying for lack of storage space. Brokers are buying only limited tonnages, largely for shipment to out-of-town mills. Prices for major steelmaking grades are steady but strong. Prices of turnings are $1 higher. Machine shop turnings are quoted at $19-$20; short shovel turnings, $20-$21; cast iron borings, $19-$20. Cast iron grades continue in

HOW ONE PLANT *Streamlines* MATERIAL HANDLING



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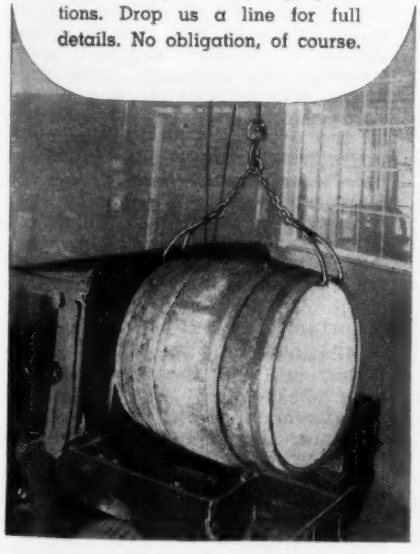

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good demand, foundries stretching their pig iron supplies with more scrap and generally continuing to operate at unchanged levels. Stove plate is bringing $33-$34. Most strength is demonstrated in railroad scrap, lists closing at higher prices for several grades. Delivered price of malleable is $37-$38; random length rails, $40-$41; 2-foot and under rails, $41-$42, 18-inch and under rails, $42-$43.

Buffalo—With leading dealers reducing yard prices on material received, scrap prices dropped $1 a ton here. No. 2 heavy melting and related items are quoted at a range of $24.50-$25 a ton. Except for activity in dealers' yards, trading is virtually at a standstill. Collections at yards is also light. Dealers are taking losses on material being unloaded from railroad cars to escape demurrage charges. Cars had been loaded in hopes of an early break in the steel tieup. Small sales of cast material are being made at declines hovering around $1 a ton.

Cincinnati—Scrap prices are unchanged. Some dealers are withholding material in anticipation of an upturn in demand when the steel strike is settled. Tonnage is moving to Armco Steel Corp.'s Hamilton and Middletown plants. Foundry demand is rather spotty.

St. Louis—Scrap buying has dropped off after two weeks in which the district's two biggest consumers laid in most of their winter needs, mostly No. 2 melting steel and short shovel turnings. Much of the No. 2 came from remote points at $28, delivered, compared to the $26 local price. The interest in turnings at $22 resulted from a desire for quicker delivery from local stockpiles. Shipments are relatively good, but some consumers are being hurt by the Missouri Pacific Railroad strike. Missouri Rolling Mill Corp., for example, is on a Mo-Pac siding and is compelled to unload scrap deliveries from a nearby Frisco siding at heavy expense for extra switching, trucking and handling. Demand for cast grades, moderate for several months, are better than usual.

Los Angeles—Scrap market shows little activity, with foundry demand slow, and only one major mill specifying. Prices are steady.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 102

Pittsburgh — Cessation in oven foundry coke output at those plants closed by strike has been offset somewhat by continued operations among a number of independent interests. Coke is being shipped into this district from Fairmont, W. Va., and to lesser extent from such remote points as Milwaukee and Indianapolis. Many foundries had about 3 weeks' supply of coke at the start of the UMW strike in mid-September. In many instances this stockpile has been supplemented during the interim and has been lengthened by curtailment in foundry operations. Several foundries in this area will be forced to shut down because of lack of coke should the coal and steel strikes last through the remainder of this month.

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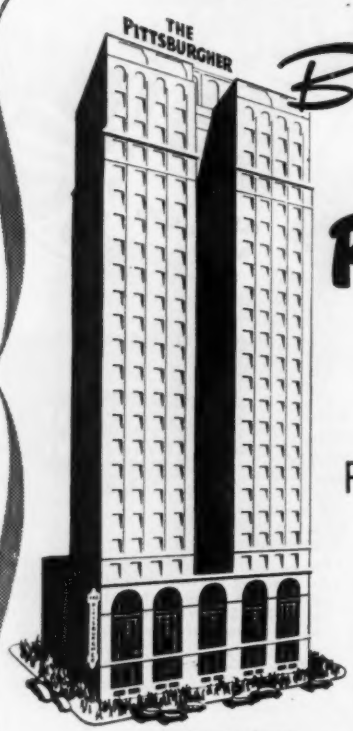

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Warehouse . . .

Warehouse Prices, Page 103

Pittsburgh—Should the steel strike continue past Nov. 1, many distributors inventories would be depleted on practically all products. Some interests have no stocks of wide-flange beams and galvanized or plain hot-rolled and cold-rolled sheets. Some have rather large inventories of hot-rolled and cold-finished bars. A marked upturn in demand for aluminum sheets is noted. Daily average shipments from warehouses this month are well over 100 per cent of those recorded in like September period. Many inquiries have been received from consumers outside this district, but warehouses are restricting acceptances to regular customers and, in many instances, have limited tonnages to a fraction of those requested. City delivery price differential remains at 15 cents.

Philadelphia—Jobbers report an active demand, but inquiry is not quite as brisk as a week ago. Consumers are finding it more difficult to get some of the specifications required, even from warehouses, and inventories are getting out of balance. Hence, there is less certainty regarding future operations. Other adverse factors are developing relating to labor and cutbacks in end-use requirements.

Cincinnati—Rapid inroads are being made into stocks of jobbers, with a pinch already developed in sheets and structurals. Big tonnage orders are offered by fabricators whose mill supplies have been cut off, but an informal rationing plan is in effect.

Chicago—Inventory balance, not overall tonnage in the shop, is the problem at most warehouses. If the strike grinds on long enough to force closure of a large segment of the metalworking industry, most warehouses will be well stocked in some sizes of products. Warehouses were in the process of balancing inventories when the strike hit. They hadn't built up the stocks they normally would carry in cold-rolled, galvanized sheets or pipe. Other materials generally were ample to conduct normal business. There were a few products, including stainless, which had been neglected when the opportunity to stock up arrived.

Milwaukee—Distributors with only a few mill suppliers are at a distinct disadvantage. A number of the warehouses which have been getting steel from mills still in operation now say that the tremendous pressure by customers for direct steel shipment from these mills is preventing intake of the required amount of several products.

Birmingham—Warehouse demand for steel is brisk. Supplies generally are satisfactory, except for some of the more popular sizes in structurals. Plates and black sheets are in relatively good supply; galvanized sheets are extremely scarce. Warehouse stocks are adequate to meet regular requirements for another 30 days.

Los Angeles—Jobbers' sheet stocks are low, but not exhausted. Galvanized and cold-rolled sheet supplies are extremely tight. Another pinch may be in the making in such specialty items as aircraft steel, which in most

instances are not produced locally.

San Francisco—Most jobbers are allocating supplies. Orders for carload lots are being refused, and old customers are being given preference. Buying is orderly with bulk of demand coming from steel users who bought directly from mills prior to the strike.

Seattle—Wholesale jobbers were well stocked when the steel strike began and are meeting a normal demand out of inventories. If the shutdown continues for thirty days, stocks of many items will be depleted.

Iron Ore . . .

Iron Ore Prices, Page 102

Cleveland—Shipments of Lake Superior iron ore from the upper lake ports have dropped sharply and will come to a complete halt soon if the steel strike is continued much longer. Shipments for the week ended Oct. 17 amounted to only 169,371 tons compared with a weekly average of over 2,400,000 tons for the season prior to the start of the steel strike. Shipments from United States ports averaged only 16,638 tons daily in the week ended Oct. 17 compared with an average of over 300,000 tons daily in September.

Total shipments for the season to Oct. 17 amount to 68,133,373 tons against 70,707,682 tons in the like period a year ago. While shipments from United States ports are off 3,087,734 tons, those from Canadian ports are 513,425 tons larger.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

4500 tons, apartment, 11 Riverside Drive, New York, to Bethlehem Steel Co., Bethlehem, Pa.

1000 tons, new agricultural library, Cornell University, Ithaca, N. Y., to Bethlehem Steel Co., Lackawanna, N. Y., John W. Cowper Co., Buffalo, general contractor.

775 tons, state highway bridge superstructure, continuous plate girder, U. S. route 2, Alburg-North Hero, Vt., to American Bridge Co., Pittsburgh; bids Oct. 7, Montpelier.

500 tons, tainter valves, trash racks, bulkheads, etc., McNary dam navigation lock, to United Engineering Co., San Francisco, low $122,700, by U. S. Engineer, Walla Walla, Wash.

425 tons, five-span WF beam bridge Vermont Route 15, Cambridge, Vt., to Vermont Structural Steel Co., Burlington, Vt.; Oscar Nelson, Montpelier, general contractor.

300 tons, state bridge, Wayne county, New York, to Phoenix Bridge Co., Phoenixville, Pa.

300 tons, 300-foot twin span bridge, Quinebaug river, Canterbury-Plainfield, Conn., to Phoenix Bridge Co., Phoenixville, Pa.; Campanella & Cardi, Cranston, R. I., general contractors; Plantation Steel Co. will furnish 40 tons reinforcing bars.

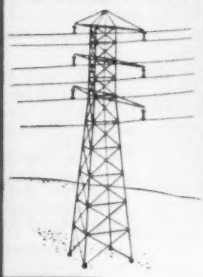
300 tons, two state King county bridges, to Bethlehem Pacific Coast Steel Corp., Seattle; State Construction Co., Seattle, general contractor.

250 tons, freight terminal for Consolidated Freightways, Seattle, to Isaacson Iron Works, Seattle; Sellen Construction Co., general contractor.

230 tons, Greenville garage, Jersey City, N. J., to Keystone Structural Steel Co.

200 tons, Washington state bridge, Methow river, to Consolidated Western Steel Corp., Seattle; State Construction Co., Seattle, general contractor.

IF IT'S IRON OR STEEL



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"But," I went on, "the important thing is that H-VW-M applies this knowledge to each wheel it turns out. That means when you specify H-VW-M polishing wheels, you're sure of getting the right wheel for your job every time.

"Tell you what," I concluded, "let's take a look at some of your polishing problems right now. We find that first hand analysis usually pays off in big savings to customers—and that's a service that is available to you anytime."

Ask your H-VW-M representative to help you solve your polishing problems, or write to "Headquarters"* for a copy of Bulletin W-102. It describes our complete line of polishing wheels and accessory products.

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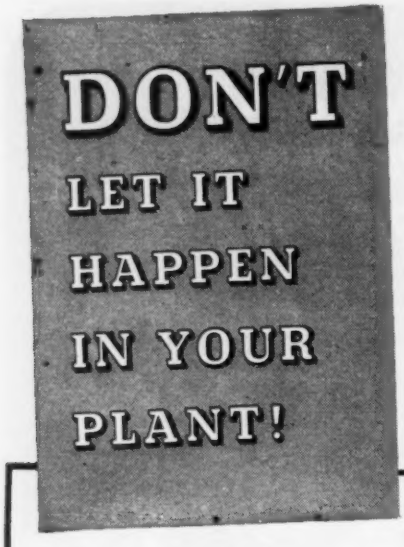

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165 tons, section of state road development, Westchester county, New York, to American Bridge Co., Pittsburgh.

160 tons, plant building, E. R. Squibb & Sons, New Brunswick, N. J., to Irvington Steel & Iron Works, Irvington, N. J.

115 tons, state road development, Westchester county, New York, to Jones & Laughlin Steel Corp., Pittsburgh.

110 tons, three-span composite deck bridge, Naugatuck river, South Leonard street, Waterbury, Conn., to Phoenix Bridge Co., Phoenixville, Pa.

Unstated tonnage, veterans hospital and utilities, Ann Arbor, Mich., to Whitehead & Kales, Detroit; J. D. Hedin Construction Co., Washington, general contractor; reinforcing bars to Pollak Steel Co., Cincinnati.

STRUCTURAL STEEL PENDING

2000 tons, East River drive, adjacent to United Nations development, New York; bids being asked through the president of the Borough of Manhattan.

1435 tons, bridge No. 25, United States project for the improvement of the Cuyahoga river, Cleveland; bids Nov. 10.

1000 tons, connecting bridge, Northern Blvd., Queens, New York; bids being received through office of the president of that borough.

700 tons, modernization of service building, H. J. Heinz Co., Pittsburgh; bids Nov. 3.

350 tons, hospital, Harrisburg, Pa.; bids Nov. 2.

400 tons, Elliot street bridge, Boston; Monroe & Langstroth, North Attleboro, general contractors.

120 tons, state bridge, Monroe county, Pennsylvania; bids Oct. 28.

100 tons, single span, composite deck, welded web girder bridge, Shelton, Conn.; bids Oct. 31, Hartford.

Unstated, steel frame warehouse for California Bag & Metal Co., Portland, Oreg.; plans prepared, bids soon.

REINFORCING BARS . . .

REINFORCING BARS PLACED

2700 tons, municipal filtration plant, Philadelphia, through Progressive Construction Co., that city, to Bethlehem Steel Co.

938 tons, Wacker drive extension, Chicago, through Herlihy Mid-Continent Co., to Joseph T. Ryerson & Son Inc., Chicago.

800 tons, apartment building, Sheridan Rd., Chicago, to Truscon Steel Co., that city.

693 tons, tuberculosis sanitarium, Chicago, to Ceco Steel Products Co., Cicero, Ill.

385 tons, sewers, Elyria, O., to Builders Structural Steel Co., Cleveland.

350 tons, new agricultural library, Cornell University, Ithaca, N. Y., to Buffalo Steel Co., Buffalo.

250 tons, Broad street substation for light department, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle; S. S. Mullen Co., Seattle, general contractor.

161 tons, Washington Park YMCA, Chicago, through Algot B. Larson Inc., to Joseph T. Ryerson & Son Inc., that city.

150 tons, University of Washington underpass, Seattle, to Northwest Steel Rolling Mills Inc., Seattle; Henrik Valle, Seattle, general contractor.

137 tons, Ohio state highway project FG687, Ravenna, O., to Truscon Steel Co., Youngstown.

125 tons, miscellaneous, including state bridge, Palouse river, warehouse for Seattle Iron & Metal Co., and others, to Bethlehem Pacific Coast Steel Corp., Seattle.

Unstated, Lincoln state school, Lincoln, Ill., to Laclede Steel Co., St. Louis.

REINFORCING BARS PENDING

1700 tons, Park Manor apartments, Ritten House street, Philadelphia; Ring Construction Co., Washington, general contractor.

438 tons, water works system, Bedford Park, Ill.; bids asked.

385 tons, water works improvements, Cedar Rapids, Iowa; Gust & Green Co, apparently low on general contract.

297 tons, site No. 1, Chicago Housing Authority apartments; Jacobson Bros. Co., Chicago, apparently low on general contract.

195 tons, Sherman hospital, Elgin, Ill.; bids asked.

195 tons, sewage treatment plant, Rockford, Ill.; bids asked.

170 tons, tunnel, Michael Reese hospital, Chicago; bids asked.

156 tons, state bridge, Westmoreland county, Pennsylvania; bids closed Oct. 8.

115 tons, building, Farm Bureau Co-operative Ass'n., Columbus, O.; bids asked.

107 tons, produce warehouse, Cleveland; bids asked.

105 tons, Agriculture & Chemistry building, Purdue University, Lafayette, Ind.; bids asked.

Unstated, Illinois research hospital, Chicago; bids Oct. 25.

Unstated, $360,000 assembly plant for Kaiser-Frazer Corp., Portland, Oreg.; bids in Oct. 17; plans by Wolff & Phillips, Portland.

Unstated, aircraft shop building, Ladd Air Force Field near Fairbanks, Alaska; Gaasland Construction Co., Bellingham, Wash., low, $296,660.

PLATES . . .

PLATES PENDING

1400 tons, Lucky Peak project tunnel lining; bids to U. S. Engineer, Walla Walla, Wash., Oct. 20.

Unstated aircraft shop building, Ladd Air Force Field near Fairbanks, Alaska; Gaas-Co., Portland, Oreg., low $112,530, to Bureau of Reclamation, Denver.

PIPE . . .

CAST IRON PIPE PLACED

800 tons, 6, 8 and 10-inch, North Raynham, Mass., to R. D. Wood Co., Florence, N. J.

550 tons, 6 to 12-inch, Westfield, Mass., to United States Pipe & Foundry Co., Burlington, N. J., through contractor.

550 tons, 6 to 12-inch, Winthrop, Mass., to R. D. Wood Co., Florence, N. J.

250 tons, Pullman, Wash., system extensions, to Pacific States Cast Iron Pipe Co., Portland, Oreg.

230 tons, 20-inch, Middletown, Conn., to Warren Pipe Co., Everett, Mass.

CAST IRON PIPE PENDING

1200 tons, 8 to 12-inch, Attleboro, Mass.; bids in Oct. 19.

500 tons, 36-inch, Logan airport, Boston; bids in.

CONSTRUCTION AND ENTERPRISE

ARKANSAS

PINE BLUFF, ARK.—Arkansas Power & Light Co. has plans in progress for office building, cost $500,000.

CALIFORNIA

LOS ANGELES—Board of Harbor Commissioners will build a $6 million passenger-cargo terminal for use by Matson Navigation Co. in Los Angeles harbor. Project will include a 2270-foot wharf and two single-span fireproof transit sheds. Bids for the first phases of construction will be called within 90 days.

TORRANCE, CALIF.—Pittsburgh Plate Glass Co. expects shortly to sign contracts for construction of a $1,250,000 paint plant on Crenshaw Blvd.; general contract for erection of the plant has been awarded to MacIssac & Menke, Los Angeles contractor.

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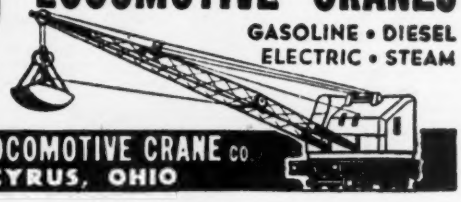

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You eliminate the cost of handling, delivery, evaporation loss and selling cost, which is a large percentage of the total cost.

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Air Products
OXYGEN GENERATORS

ucts Co., 6467 N. Avondale St., Chicago, has awarded the general contract for construction of a factory building at 8020 N. Austin Ave. to E. W. Johansen, 3853 N. Keeler St., Chicago, at approximately $72,000. Frank L. Glick, 3938 N. Central St., Chicago, architect.

OHIO

CANTON, O.—Incorporation papers have been filed for the Industrial Chrome Corp., an established firm at 116 Seventh St., by Mildred E. Lawson, Karl A. Feist and Maurice W. Wendling, attorney, also agent, 618 Renkert Bldg.

CLEVELAND—Edwin J. Gilles has formed Gilles Machinery Co., 413 Caxton Bldg., to continue to represent machine tool manufacturers. Among the lines will be: Hendey Machine Co., Gallmeyer & Livingston Co., Cleveland Planer Co., Armstrong-Blum Co. and Cushman Church Co. Mr. Gilles was half owner of Jeffery-Gilles Co., which was dissolved Aug. 31.

CLEVELAND—Parma Sheet Metal Inc. has been incorporated to manufacture and deal in sheet metal products. Incorporators are Vesyl Kirschstein, Lois D. Coriell and Alma L. Aurelius, wife of Earl M. Aurelius, attorney, 630 Williamson Bldg., who filed the incorporation papers.

FOSTORIA, O.—Fostoria Screw Co. has been purchased by a group of Cincinnatians, composed of Sidney Rose, 1400 Harrison St.; Philip Moskowitz, 3901 Ledgewood; Ben Moskowitz, 4148 Paddock Rd.; Joseph Hoodin and Fred Weiland, attorneys, Enquirer Bldg. The purchase was made from Bowser Inc., Fort Wayne, Ind. This group also acquired Merritt-Monsanto Co., Lockport, N. Y., a wholly-owned subsidiary of Monsanto Chemical Co., from which it was purchased. It will operate as Merritt Engineering Co., manufacturing and designing machinery to convert logs into plywood.

PENNSYLVANIA

SOMERSET, PA.—Peter F. Loftus Corp., engineer, Oliver Blvd., Pittsburgh, has been selected to prepare plans and specifications for Project No. G. S. A. 512-2 for construction of a new boiler plant at Somerset State Hospital.

WASHINGTON

SEATTLE—Contractors' bids will be opened next month for construction of a $1 million transmitter building, central part of a new Naval radio station designed to be the most powerful in the world, to be located at Jim Creek, Snohomish county.

CANADA

HAMILTON, ONT.—Construction will get underway at once on a $175,000 two and a half story warehouse building for T. Eaton Co. on Rebecca St.

FERROALLOYS

(Concluded from Page 103)

Titanium Alloys

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot $1.28, less ton $1.35, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $160 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 3-4.5%). Contract, $175 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

Vanadium Alloys

Ferrovanadium: Open-Hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.), $3.10.

Grainal: Vanadium Grainal No. 1, 93c; No. 6 63c; No. 79, 45c, freight allowed.

Vanadium Oxide: Contract, less carload lots, $1.20 per lb of contained V_2O_5, freight allowed. Spot, add 5c.

Tungsten Alloys

Ferrotungsten: (70-80%). Contract, 10,000 lb W or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

Zirconium Alloys

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

Boron Alloys

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $4.25 per lb contained B, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

Other Ferroalloys

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Contract, ton lot, 2" x D, $2.90 per lb of contained Cb, less ton $2.95. Delivered. Spot, add 25c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Carload, 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8% Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed. 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 16.5c per lb of alloy, ton lots 17.50c, less ton 18.5c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.00c per lb of alloy; ton lots 18.00c; less ton lots 19.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c, f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Lump, bulk, carload 11.00c. Ton lots, bulk 11.50c, packed 11.75c. Less ton lots, packed 12.55c per lb of alloy, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Ferrophosphorus (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); Gross tons per carload, f.o.b. seller's works, Mt. Pleasant, or Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth and Washington, Pa., furnace, any quantity $1.10.

Technical Molybdic-Oxide: Per lb, contained Mo., f.o.b. Langeloth and Washington, Pa., packed in bags containing 20 lb of molybdenum, 95.00c.